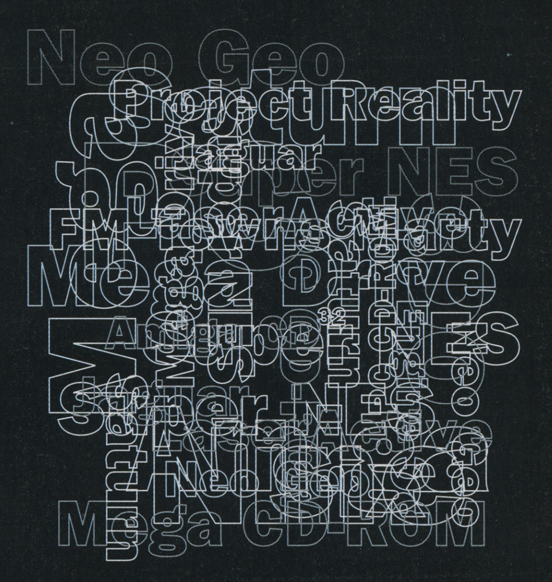


3D Studio once again proves its mettle in Cryo's *The Lost Eden* for PC CD-ROM, CD-i and CD32. But instead of rendering machinery, it's breathing life into a magical kingdom with 'ethereal beauty'


EDGE



The more things change, the more they stay the same

Whether the manufacturers like it or not, interactive entertainment hardware is all heading toward a single goal, and some sort of standard isn't far away.

3DO's sole intention is to achieve just that: in Trip Hawkins' ideal world, your machine does the same as any other – you simply choose the branded system with the preferred styling, or the one which has the best features or bundles the best software.

This is comparable to the VHS system, and – once the V2000s and Betamaxes had gone – it didn't do the home video market any harm.

And although other manufacturers decry the notion of a 'standard machine', opting to retain absolute control over their small slice of the market, they are only postponing the inevitable.

Sure, at the moment gamers have a choice of power: you can opt to buy a Saturn because it has better texture mapping than, say, Jaguar.

But with each new generation of machine, we are seeing a convergence in performance. Machines already all display 24bit true colour images and play CD-quality sound; there is little improvement to be made in these areas. Graphic manipulation – scaling and rotation – is present in most of the new systems. And it won't take long before 3D texture mapping is standard; MPEG video will be standard; connection to the cable network will be standard…

It won't happen for a while – but it will happen. And the advantages are indisputable: games will work on any machine; developers can concentrate on one format; distributors and retailers are relieved of the pressure of multiple stocking. And if machines are made upgradeable, obsolescence – the bane of any paying gamer's life – will be a thing of the past.

The **future** is almost here…

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Voted **Magazine of the year**



Industry awards



42



Photography: **Rob Scott**

CD³² – Too **little,** too **soon?**

Commodore's hopes of console domination rest squarely on the CD³². But with a library of straight Amiga ports and the imminent threat of hardware from Japan, **Edge** wonders whether Commodore's second coming was a little premature…



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Namco: Leader of the Pac

Namco are arguably the finest proponents of the coin-operated videogame, with titles like *Pac-Man*, *Pole Position* and, latterly, *Galaxian³* and *Ridge Racer* (above). **Edge** was allowed an audience with the Pac men

insideview

6 News

For all the very latest information on the global arena of interactive entertainment, look no further than **Edge**'s news pages. Even the people making the news read it here first…

18 This month on **Edge**

A catalogue of the events, occurrences and happenings that went into the melting pot of **Edge 8**. (Not to mention some hot rumours)

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Your chance to interact with **Edge** in a vaguely entertaining fashion

23 Prescreen

Edge takes a long, lingering look at some of the new gaming experiences about to debut across all formats: *The Lost Eden, Inferno, Aliens Vs Predator, Top Hunter* and *Road Rash*. Again

42 **Hard**ware: **CD^{32}**

With their much-vaunted 32bit CD machine, have Commodore tapped a rich vein? Or will this ugly, underspecced machine be dead and buried in six months' time?

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With **Edge** now on its eighth edition, chances are you've missed an issue. But not for long…

54 **Namco:** leader of the **Pac**

Edge was given privileged access to the Japanese gaming giant, and allowed a personal audience with some of the men who have helped shape the videogame market

65 Testscreen

Not so much a review section, more a showcase for the best titles from the world of videogames

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Six pages of jobs in interactive entertainment

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No, don't subscribe: it's much more fun walking miles round town to find the last bagged copy

100 An audience with…

The 3DO Company's very own SVP (of sales and marketing) talks to **Edge** about the UK launch

104 Questions & Answers

It's a technological jungle out there; **Edge** supplies a guide and a bloody big machete…

6

Illustration: Kath McCloskie

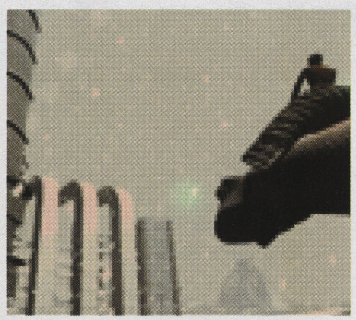


News

Once again, **Edge** drives down the information superhighway for more news on the latest hardware: Saturn (pictured left), PS-X, Tetsujin and 3DO. We also have a full report from the AOU exhibition in Chiba, Japan, where *Daytona* stole the show

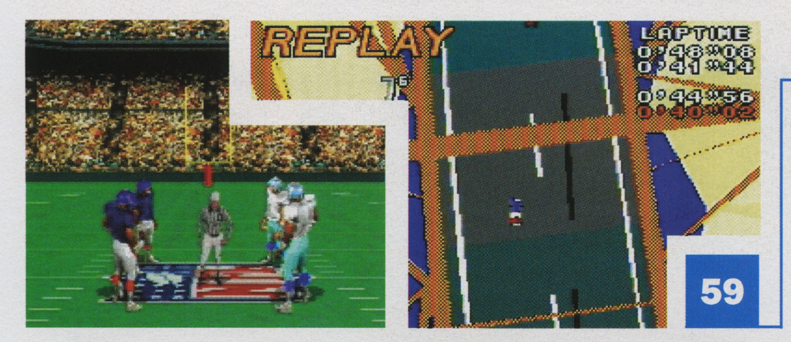
23





Prescreen

Among this month's up and coming smallscreen stars are *Inferno* (left) and *The Lost Eden* (right) – both on the PC and both looking gorgeous



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Testscreen

Originality might be at an all-time low, but gameplay still counts. Top joypad-breakers this issue are 3DO *John Madden* (left) and MD *Virtua Racing* (right)

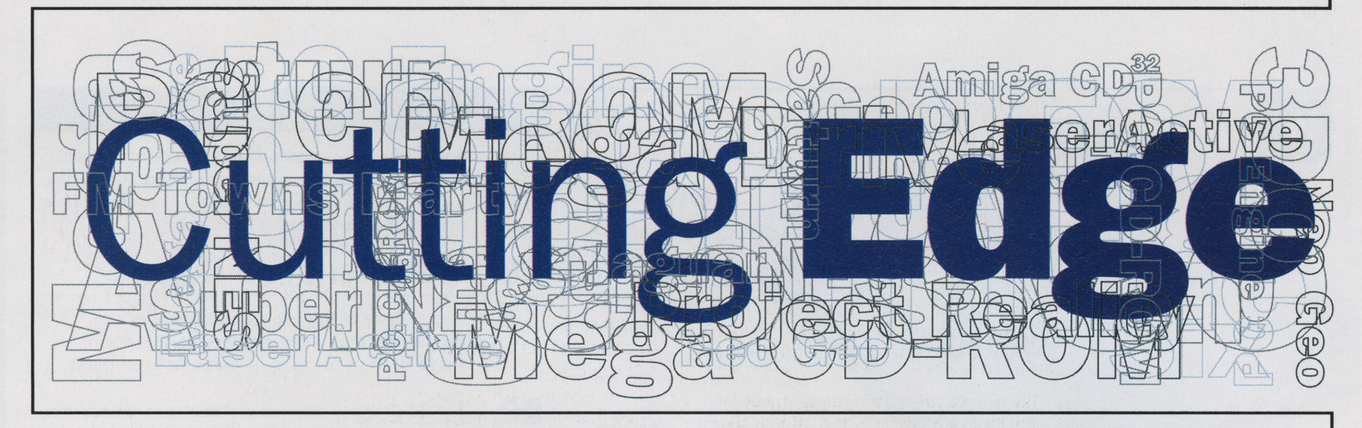
Photography: Rupert Pupkin

Bob **Faber**

With 3DO about to begin its long-awaited assault on Europe, **Edge** spoke to Bob Faber – Senior Vice-President of sales and marketing at The 3DO Company – about their battleplan, combat strategy and fighting chances

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Daytona shows up at **AOU, page 8...** Revolutionary **3D games** system unveiled, **page 12...** NEC's new **Arcade Cards**: the **PC Engine** gets upgraded, **page 14... PS-X** publishers receive development tools, **page 13...** Date set for launch of **UK 3DO**, **page 16...**



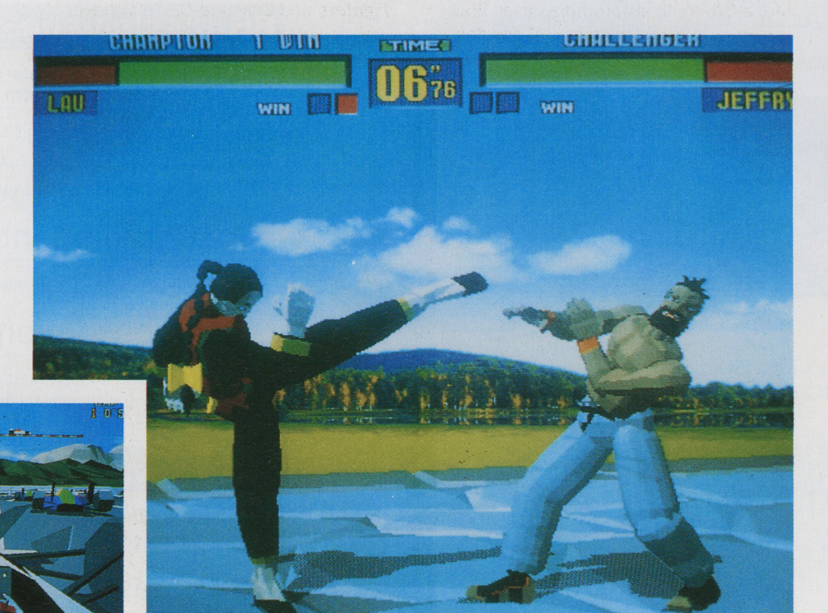
The very latest **news** from across the entire world of videogaming

Mega Drive boost: next stop **Mars**

Sega's lofty ambitions for 16bit systems bring another planet into view

Sega's worldwide publicity steamroller went into overdrive on March 14 as several new hardware projects leaped into the fray, against a backdrop of speculation about existing plans for Saturn. Sega revealed that work would cease on the Jupiter, the 32bit Saturn-based cartridge machine and would be switched to a similar project, codenamed Mars, destined initially for the US and European markets.

Mars differs from Jupiter in that it is a 32bit upgrade for existing Sega 16bit hardware. Designed to plug into the Mega Drive's cartridge port rather like →



Virtua Racing **fans will be overjoyed with Mars – Sega have promised *VR Deluxe***

Sega's *Virtua Fighters* will not only be one of the first two Saturn games, but now Mars is coming you can expect a 32bit Mega Drive version too

MD gets carried away



Sega Japan have just launched a new handheld version of the Mega Drive, called The Megajet, at a cost of ¥15,000 (£90). The machine, complete with small LCD screens, is currently being used on first class JAL flights, but the home version is effectively a portable singleplayer machine that plugs into the TV.



The arcade racer *Daytona GP* (above) will be available on Saturn at launch

Titan: Sega's 2D testbed for Saturn

Edge has uncovered details of Sega's 32bit Titan arcade board. What was initially thought to be a spin-off or successor to Daytona's Model 2 hardware is now understood to be based on 2D technology. One rumour suggests Titan technology will be licensed to other coin-op companies, effectively giving them a Saturn test platform in the arcades.

If Titan is successful, Saturn could well end up with a catalogue of coin-op-perfect arcade games.

← the Master System Power Base Converter, Mars boosts the performance of the 16bit console with two Hitachi SH2 chips, extra RAM and a newly designed video processor. And it will even upgrade the capabilities of the Mega CD when Mars-compatible games are programmed for it. The system will be known as the Genesis Super 32X when it's released in the US this Autumn at a cost of $150 (£100), with a UK version following around Christmas this year, priced at £150. Developers are expecting to receive Mars development kits in April.

Apart from Saturn, which will arrive much later in the US and Europe than Japan, an all-new Mega Drive incorporating the Mars technology will be appearing in early '95 for £175-200, completing the line-up.

But just what kind of performance are we talking about here? One Sega official claimed that the technological jump would be 'at least as big as the one between the Master System and Mega Drive'. Mars promises over 256 onscreen colours, high-speed polygon rendering, texture mapping, improved software motion video, enhanced scaling and sprite rotation, and (deep breath) improved sound, with the aid of a new chip. All in all, an impressive bundle of technology.

Sega have announced that they have more than 30 titles in development for the new kit, including *Virtua Fighters*, *Virtua Racing Deluxe* and a 3D soccer game. Third party licensees are expected to deliver a similar number during the first year after the unit's introduction, with pricing of the new software expected to be in line with current 16bit prices.

So where does Saturn fit into this grandiose plan? In Japan at least, it doesn't. The failure of the Mega Drive in Sega's home market means that Saturn will instantly spearhead Sega's 32bit assault in November this year as planned, with US and European versions following in 1995. **Edge** understands that Saturn will offer a significant leap in performance over Mars-boosted 16bit hardware. As hinted last month, news about Sony's PS-X has prompted Sega to up Saturn's specs and a 64bit video processor is thought to be just one improvement.

So, while the US and Europe start drooling at the prospects of 32bit Mega Drive and Mega CD games, Sega Japan are pressing on with Saturn. On February 14, over 300 developers were shown a mock-up machine, as well as development tools and demos of games in development. 12 Saturn titles are expected during November and December '94, with 17 more between February and March 1995 and 12 between May and July. On top of that, thirdparty licensees will deliver 35 titles for the first half of 1995.

And the first Saturn games? *Virtua Fighters* and *Daytona GP*. Whichever way you look at it, Sega seem to have it covered. Let's just hope they don't run out of planets before the next level truly arrives... **E**



Saturn now includes a 64bit video processor

Where is it?

This is the place where, in June, Sega will be showing off its up and coming products, and where Sega's thirdparty licensees can discuss all matters Sega. The event will be taking place in America, near a major tourist attraction



***Virtua Soccer*, perhaps? Still without a title, this soccer game in development for Saturn features an excellent texture-mapped stadium and detailed players**



This clockwork doll 'action' game introduces proper 3D backgrounds and animation. See that cuckoo in the clock? It's made of polygons

Daytona shines at AOU show

The Japanese Amusement Operators' Union show took place recently in Tokyo. Edge was there

it is...

Orlando, Florida. Eschewing the pleasures of Chicago in June, Sega have opted to host their own event for buyers and licensees. 'Non-Sega products and marketing materials may not be presented,' they state

The AOU is the first big coin-op show of the year in Japan, and every bit the Japanese arcade industry's Spring catwalk for parading new games and technology. Surprisingly, though, there weren't many games at the February show that hadn't already been exhibited at the London ATEI (Amusement Trade Exhibition International) in January. The biggest crowd-pullers were, as expected, Sega's *Daytona*, and *Super Street Fighter II X* from Capcom, but the much rumoured Project Reality and Saturn demos failed to materialise.

The omnipresent Sega were, inevitably, in attendance, showing off *Jurassic Park*, *Star Wars*, *Dragon Ball Z* and, of course, *Daytona GP*.

Jurassic Park is a shameful *Line Of Fire/Rail Chase*-style shoot 'em up in which the majestic dinosaurs of the movie have been reduced to moving targets. Sure, your gun is supposed to be a tranquiliser, but instead of resurrecting the great lizards, your task is now to send them to whence they came. Very disappointing.

Star Wars has all the makings of an epic, but the Model 1 board which drives it looked pitifully short of power →



There's more than one way of stealing a show – like having 13 *Daytona* cabinets linked together for the ultimate racing experience



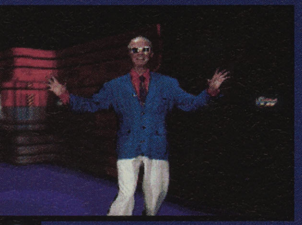
Inside the massive Makuhari Messe – venue of the All-Nippon AOU Show

Attract mode

Every issue, Edge goes to great lengths to find the very best in what might be called 'introtainment'. Or maybe not. Anyway, this month's Attract Mode is taken from *Megarace* – Cryo's splendid CD-ROM race game which has more than its fair share of visual finery. Take it away, Lance...



1 Exterior shot. The camera tracks along behind a hovercraft as it glides towards a towering neon cityscape. Huge public vidscreens display the top-rated TV show of all time



2 Cut to apartment interior. A small droid scurries about, collects a remote control and turns on a wall-sized TV screen. As if on cue, Lance Boyle – mad host of Megarace – leaps into view



3 Close-up on Lance as he explains the rules of the show in his own inimitable style. Cut back to apartment interior, where the owner has appeared. It is time for Megarace, after all

Sega have taken their texture-mapping to a ridiculous extreme with this Mount Rushmore-style Sonic



The finished *Daytona* – under the banner of *Daytona USA* – was on show at the AOU. Initial reaction was that it's better than *Ridge Racer*

← when attempting to shift fleets of Star Destroyers around the screen. This co-operative twoplayer – pilot and gunner – shoot 'em up has been finished for a while, but Sega are still having trouble over the *Star Wars* licence – which **Edge** assumes they simply don't have – so *Star Wars* may never see the neon light of an arcade.

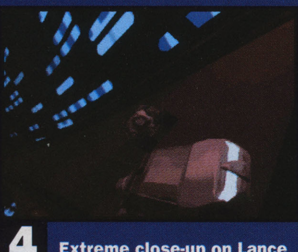
Dragon Ball Z, which was first seen at last year's JAMMA show, was something of an anomaly at the AOU in that it actually contains a high level of originality. This odd combat coin-op sets two players against one other – each one having his own screen – but instead of the normal joystick/fire buttons interface, the player physically acts out his moves. An upgraded

Continued next page

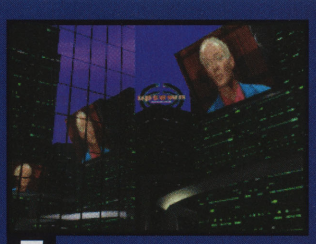




Running on Sega's Model 1 board, the still-unfinished *Star Wars* was not perhaps as impressive as it should have been. The 3D is un-textured and the gameplay confusing. And, due to a lack of a licence, it may never even appear



4 Extreme close-up on Lance as he goes through his well-rehearsed act. Cut to shots of Megarace in action. The camera pans around as two racers jostle for position on the virtual course



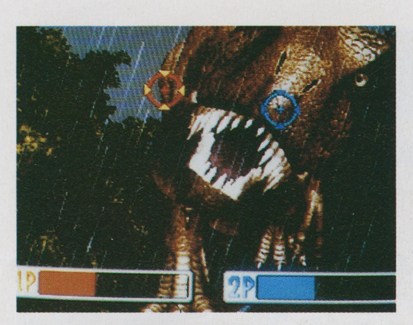
5 Cut to city exterior. The camera swoops between the towering skyscrapers. Huge TV screens adorn many buildings – all for the purpose of broadcasting the populace's favourite show

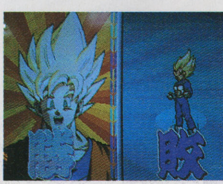


6 Cut back to Lance. He describes the different locations where the Megarace contestants will practise their skills. Cut to exterior view of one such racetrack



7 Cut to exterior, high above a bridge. In the distance two cars hurtle towards the camera, which pans down to meet them. The cars zoom past beneath. Game on...





Playing a supporting role to *Daytona* were Sega's disappointing *Jurassic Park* (top) and the exotic *Dragon Ball Z* (above) – a person-sized beat 'em up

Continued

version of Sega's Activator hardware for the Mega Drive) detects the motion and converts it into frames of animation, whereupon your onscreen alias performs the requisite attacking moves.

The onscreen characters are based on the *Dragon Ball Z* anime series and so the graphics and animation are particularly impressive – especially considering that the onscreen figures are as big as the player. Displayed on screens several feet high, *Dragon Ball Z* uses sprite technology to render the massive characters.

The finished version of *Daytona* debuted under the guise of *Daytona USA*, and with a huge 13player version formed by an impressive line of interconnected machines it was greeted with the interest it deserves. Now resplendent in its texture-mapped livery, *Daytona* looks every inch a thoroughbred – and with a lineage that includes *Out Run, Super Monaco GP* and *Virtua Racing* it should be a very capable racer.

Most of *Daytona*'s gameplay features are borrowed from the Sega stable. Gamers can select from 10 different cars and, thankfully, now race on three different courses: the Daytona 500 oval track, the Grand Canyon and a coastal course. During play you can opt to view the action from one of four viewpoints, à la *Virtua Racing* – and what a view it is.

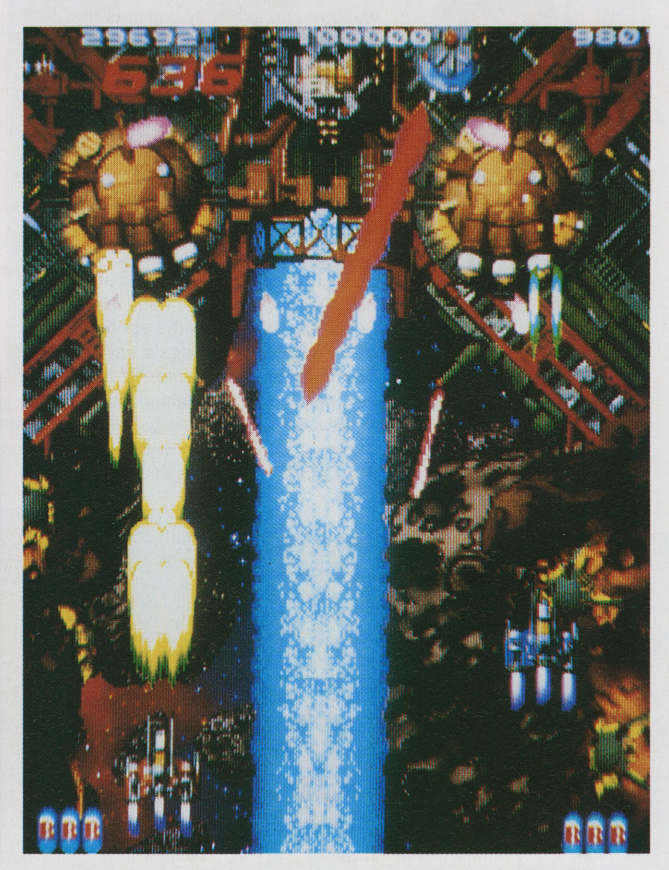
Sega have piled several layers of graphic realism on top of the demo version (Prescreen, **Edge** 7), with everything now texture-mapped in great detail, from the decal-swathed bodywork to the spectacular roadside scenery. There are also glorious photorealistic backdrops that scroll behind the polygons, rear window scrolling reflections from the sky, shadows that fall realistically on the bonnet, and a mapped-on chassis and exhaust system for the undersides of the cars – of course, you only see that when you roll the car. And when accidents occur (which they do regularly) the car's shape changes according to just how much damage it has sustained.

Of course, the only people displeased at the appearance of *Daytona* are Namco, whose *Ridge Racer* now has some serious multiplayer competition.

Not content with one racing game, Namco were showing off the top of the *Final Lap* evolutionary ladder, *Final Lap R*. But unlike the fanciful *Ridge Racer, Final Lap R* has been licensed from the FOCA (Formula One Constructors' Association) and faithfully represents the F1 racing scene.

Again, racing realism is the keyword, with reproductions of real-life →





Namco's *Final Lap R* (left) represents the apex of their successful *Final Lap* series, with extra courses and an improved sprite-scaling engine. Shoot 'em ups made a welcome return at the show, with Namco's excellent *Nebulus Ray* (right) at least showing that there's life in the old dog yet



© Konami

... And their vacuous *Racin' Force*, with dated gameplay and basic graphics, only served to confirm Edge's fears

© Konami

***Gokujo Parodius* from Konami – the culmination of nine years of *Gradius* games. Sadly, it only goes to show Konami's lack of any new direction...**

← racing tracks, plus four new tracks: Germany's Hockenheim, Hungary's Hungaroring, the Brazilian Interlagos and the Belgian Spa-Francorchamps. There's also a variety of cars, again based on the real hardware of MacLaren, Benetton, Ferrari and Williams (no guessing which is the favourite choice there).

Namco made the most of *Final Lap R* by again providing punters with the opportunity of playing the eightplayer link-up system – with eight sit-in cabinets all shuffling around, it was an impressive sight.

Using Namco's new System FL board, *Final Lap R*, with its improved colour palette, enjoys a higher level of detail than its predecessors, and the 3D modelling is smooth and very fast. However, it still uses the sprite-scaling technology seen in Sega's early machines. Given the interest in the two new polygon racers, this style of game must be doomed.

And this also applies to Konami's *Racin' Force*, a bland racer (shown in **Edge** 7) which belies the seven-year gap since its prehistoric ancestor, *WEC Le Mans*. The cars are nicely designed and rendered, but the roadway is devoid of scenery, but for a few simple-looking trees and a grandstand or two. And the low level of visual competence makes the choice of four tracks all the more derisory. It was reasonably good fun to play, but like Konami's new *Parodius* game, more of an indication of the technological chasm that now lies between competing arcade companies. *Nebulas Ray*, Namco's new vertical scroller, looked very smart, though, with superb explosions and excellent depth and scaling effects.

The one

game genre generously catered for at the AOU show was the one-on-one beat 'em up – as ever, there were cabinets full of them, including Super *Street Fighter II X* (Capcom), *World Heroes 2 Jet* (ADK), *Fighter's History Dynamite* (Data East), *Art Of Fighting 2* (SNK) and *Blood Warrior* (Kaneko). And, apart from the latter, which is a *Mortal Kombat* lookalike, they're all based on Capcom's mould-making classic – in its fifth incarnation here.

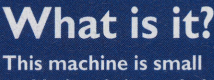
Super SFII X (or *Turbo* as it will be known in the UK) is more of an upgrade than a sequel. The player can control any of the 16 fighters from *Super SFII*, but the speed has been increased, the graphics improved, and a new Combo gauge appears at the bottom of the screen. Whenever a special attack is made, the gauge gradually fills; when it reaches maximum, the word 'Super' flashes and a new, unstoppable Special Combo attack can be unleashed on your opponent.



Jaleco's software was beautifully put together. Sadly, the same couldn't be said for their *F1 Super Battle* racer

BUZZ words

virtua
drop the 'L' pal virtual's yesterday's news it's virtua this virtua that now what a fab word it's like smaller than virtual right but better you only have to put racing or fighters after it and you're bloody laughing next year i'm gonna get me virtu racing and virtu fighting that'll be as smooth as you like with a billion smart camera angles it's those japanese again making everything smaller but better you know i mean in 1995 it'll be virt fighting then vir racin then vi figh then v r then nothing r then nothing nothing...



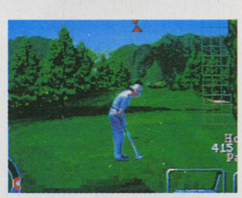
What is it?

This machine is small and beige. It is made by Nintendo. It is compatible with cartridges that are roughly two inches square, enabling you to play games like *Tetris*, *Super Mario Land*, *Dr Franken*, *Tennis*...

Continued next page







SNK's *Top Hunter* (top) and Konami's *Golfing Greats 2* (middle) were popular, but the competition proved too tough for Jaleco's *F1 Super Battle* (above)







Virtua Cube-X (above) and *City Diver* (left): real 3D action from Sanyo/Taito

Rather predictably, Capcom officials at the show refused to comment on the possibility of another version of *SFII* appearing. A *Super Street Fighter II XXXX* complete with macho Australian beer monster, perhaps?

One of the most impressive things at the show was a 3D demo by Taito in conjunction with Sanyo Electric Co. And we're not talking Sega *Time Traveller*-style 3D, or Children In Need 3D here; we're talking 70-inch and 40-inch 'autostereoscopic' LCD displays which can show 3D images without the need for a stereo headset or multiple screens. Sanyo – in conjunction with NHK Engineering Services and Toppan Printing – have developed an LCD projector and lenticular lens array which splits the picture into right- and left-side images, providing the viewer with full depth perception.

Taito are developing software for use with the displays, the first examples of which will be *Virtua Cube-X* and *City Diver* – a stunning fourplayer 3D shoot 'em up with a mixture of gorgeous rendered images and 3D polygons. The full system is due to be unveiled at the JAMMA show in September.

it is...

The Super NES. Nintendo have just announced a cartridge that enables gamers to play their GB carts on the SNES, in colour. The adaptor costs $60 and, apparently, future Super GB carts will run in 256 colours. Whoopee

Continued



Super Street Fighter II X (inset). The fifth version of Capcom's classic still managed to draw the crowds (main)

Datebook

April

European Computer Trade Show 10–12 April, Islington Design Centre, London. Open 9:30–4:00. For further details call: 081-742 2828

International Computer Show Friday 22 April–Sunday 24 April, Wembley Exhibition Hall. Open 10:00–6:00 Fri–Sat, 10:00–4:00 Sun. Tickets £7 adults, children under 10 £5. Advance ticket discount. Call: 0222 512128

Database Systems Exhibition Tuesday 19 April–Thursday 21 April, Olympia Conference & Exhibition Centre, Hammersmith Rd, Kensington, London. Contact Interactive Exhibitions Ltd on: 081-541 5040.

May

IALTEX '94 Tuesday 10 May–Thursday 12 May, Thorpe Park, Surrey. A chance to see the latest simulation techniques, merging audio visual technology with the concept of virtual reality. For further information contact Sandie Harris, or Ken Mather Public Relations on: 061-236 0677, or World's Fair Exhibitions: 061-624 3687.

All-Formats Computer Fair Thursday 19 May at the Novotel Hotel, London, Hammersmith. One-day event. Contact Bruce Everiss on: 0608 662212.

Spotlight '94 28–29 May, Novotel, Hammersmith, London. All the latest Atari and Amiga hardware and software. £3.50 advance, £5 on the door. Open 10:00–6:00. Call 081-345 6573 for details.

June

Multimedia Exhibition Tuesday June 7–Thursday June 9, Earls Court, London. For all things multimedia. Call the show organisers on: 081-742 2828.

Computer Solutions Exhibition Tuesday June 7–Thursday June 9, Scottish Exhibition & Conference Centre, Glasgow. For more information contact show organisers Trident Exhibitions Ltd in Devon on: 0822 614671.

Internet World Exhibition Tuesday 10 June–Thusday 12 June. Networking show taking place at the Novotel Hotel, London, Hammersmith Road, Kensington, London. Call Meckler Ltd on: 071-976 0405.

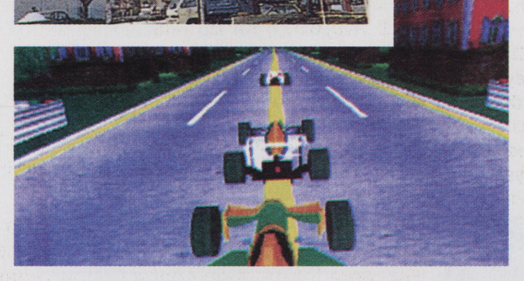
Consumer Electronics Show, Chicago Thursday 23 June–Saturday 25 June. Organised by the Consumer Electronics Group of the Electrical Industries Association. By far the biggest show in the games calendar. Call (202) 457 8700 for more information.

Show organisers: if your show isn't listed here, it's only because you haven't told **Edge** about it. Do so on 0225 442244, or fax us on 0225 446019, or send details to **Datebook, Edge, 30 Monmouth Street, Bath, Avon BA1 2BW**

Sony delivers PS-X tools

Sony's PS-X seems to be well on track for its Japanese launch. Edge has confidential details of its progress

Despite all the various non-disclosure agreements, **Edge** can reveal that Sony have delivered development hardware and tools for its PS-X project, which is on schedule for launch in Japan this November. Two of the first companies to receive kits are Capcom and Konami, who are under contract to get software ready in time for the launch.



Sony's PS-X F1 demo (above) – this still image belies the game's incredible speed. Sony's Tokyo HQ (top)

Given the two companies' commitment to long-established sprite-based games, it will be interesting to see what they come up with. One rumour has already suggested that Konami are working on a version of *Gradius* for the PS-X which might also appear in the arcades using Sony's hardware.

The name of Sony's console (PS-X is just the project name) is also expected to be released to the Japanese press soon.

The traditional Japanese stranglehold on videogame manufacture looks like being sustained when Sony enter the market late this year. Sony's decision to go with CDs intially raised questions in the minds of developers about where they would get hold of discs and how much they would cost. Confidential licence conditions have revealed that Sony will produce CDs for publishers at a price of either ¥900 per unit or 10% of the retail price, whichever is the highest figure, with mastering and licensing fees to be added on top. There is also a special rebate for hit titles. Three years after the release of a game, a retroactive rebate would be paid, ranging from 3% for sales of around 500,000 up to 10% for sales of over 2 million copies.

As development starts, this is Sony's provisional gameplan for the next few months:

Hardware/software tools
¥1,350,000 (£8,000)
Includes: target box (end March);
software development tools (end March);
PS-X board (July).

Graphics artist board
¥250,000 (£1,500)
Includes: Graphics starter kit (available now);
3D graphics tools (March);
Sprite editor (end April);
3D graphics modeller (end April).

Sound board (May)
¥150,000 (around £900).

Incidentally, Ian Heatherington, joint managing director of Psygnosis and Sony Electronic Publshing, presented the keynote speech at the Computer Arena in Monte Carlo. This was accompanied by a video showing the genealogy of the videogame, culminating in the demo of F1 on the PS-X (see **Edge** 6). From the fleeting glimpse that was available, **Edge** can only say that it was very, very impressive. The camera starts with the rear-on view and then swoops around for a side-on view of the course and the surrounding scenery. And it does it very quickly indeed. E

Atari go for Bally link-up

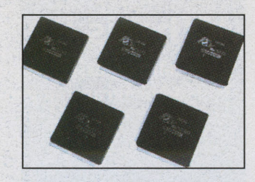
In a reflection of the increasingly cooperative mood of the videogame industry, Atari have been looking to secure relationships with major players in both the consumer and coin-op sectors. The latest – and as yet unconfirmed – news concerns Bally Midway. Edge understands that the producers of *Mortal Kombat* are considering embarking on a project to use the Jaguar chipset inside future coin-ops. The first game to use the 64bit board? *Mortal Kombat III*, no less. Atari UK are refusing to comment, saying that announcements will be made at the European Consumer Trade Show (ECTS) next month.

Data stream

Actual number of unit sales for the UK home computer market in 1993: **705,000**
Number of expected unit sales for the UK home computer market in 1994: **785,000**
Percentage of computer and videogame retailers who said their companies' first quarter performance of 1994 has been the worst ever: **48**
Percentage of retailers around the UK who still stock Atari VCSs: **14%**
Percentage of videogame sales made to consumers under the age of 15 in 1993: **70%**
Retail sales for Nintendo products in the US for the year ending March 93: **$4,287,000,000**
Nintendo's projected retail sales in the US for the year ending March 1994: **4.7 million**
Total assets of Sega Enterprises Ltd, 1992-1993: **$2,537,859,000**
Number of shareholders of Sega Enterprises Ltd: **22,163**
Number of PCs in American homes in 1993: **24 million** (10 million fewer than had Nintendo systems)
Number of units sold of Nintendo's first videogames system, the 1977 Colour TV Game 6 (a machine that played six versions of 'Pong'): **1 million**
Value of software dumped by Atari in 1983: **$210,000,000**
Value of the UK console market in 1992: **£556 million**
Value of the UK console market in 1993: **£750 million**
Interplay's turnover in 1993: **$50 million**
Cumulative sales of Super Mario Bros. 3: **14 million** (by record-industry standards, SMB3 has gone platinum 14 times)

Iron Man heads for scrapyard

NEC may be recasting their Tetsujin (Iron Man) project...



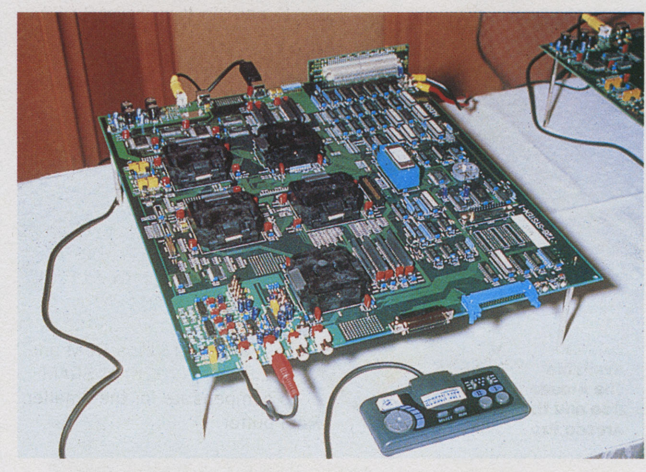


Hudson's original chipset for the Tetsujin (top) ran a demo of *Super Star Soldier 3D*

After a slew of rumours and what must have been an agonising wait for diehard PC Engine fans, some details have finally emerged about NEC's next console, originally dubbed Tetsujin (Iron Man). The release of the machine, now simply called 'FX', was anticipated to be released at the end of the year, but as **Edge** went to press, news came in from two sources that the current project could be abandoned in the light of the superior performance of Sega's and Sony's new hardware, both expected to appear at a similar time.

Details on graphics hardware are hard to come by, mainly because the final specs have never been announced, but while the original Tetsujin project included five Hudson custom co-processors, the FX is now thought to rely on only one Hudson chip. So realtime polygon rendering as seen on Saturn and PS-X won't be a feature of NEC's machine. Instead, NEC are counting on some unusual digital-video trickery and advanced data compression, but all that's known is that it will use a 'digital movement system' which can refresh 24bit colour images at 30fps.

The chances of the FX appearing before the end of the year are unlikely, but of course, we'd like to be proved wrong...



NEC's original 32bit Tetsujin board (above) has now taken on a whole new identity

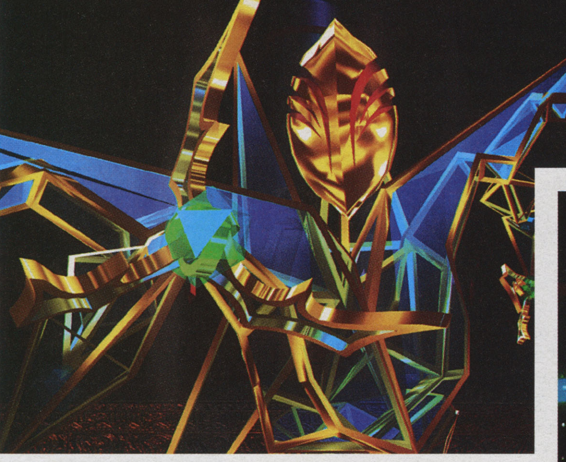
NEC FX tech specs

The only specs so far released by NEC

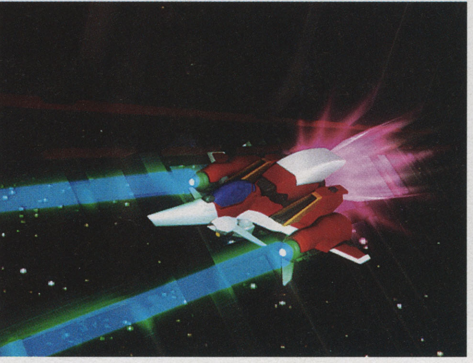
Main CPU: 32bit RISC V810 (NEC) @ 31.5MHz

CD-ROM: Double-speed Communication interface slot

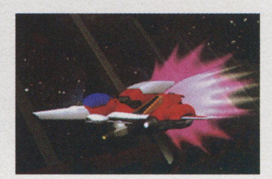
Memory: 2 megabytes DRAM; 1.25 megabytes VRAM; 1 megabyte ROM; 256K CD RAM buffer; 32K SRAM



NEC's new 24bit colour images (above) give an indication of the quality of the FX's digital video system. The rendered spaceship (right and far right) is shown at various stages







PC Engine **powers** up



NEC's new Arcade Card system gives the PC Engine another fighting chance

NEC have released a high capacity memory upgrade card for the PC Engine's multifaceted CD-ROM system. This will give this popular but dated system a much-needed hardware boost.

In fact, two cards are available – the 'Arcade Duo' and the 'Arcade Pro'. The Arcade Duo card is for the PC Engine's current Super CD-ROM² system, running on the Duo, Duo R, and Super CD. It costs ¥12,800 (approx £80) and includes 16Mbits (2Mb) of DRAM, taking the total available RAM to 18Mbits.

The Arcade Pro card for the older CD-ROM² system is more expensive. At ¥17,800 (approx £110) it includes the same 16Mbits of DRAM but also extra Bios ROM and 1.5Mbits (192K) of SRAM to compensate for the smaller RAM buffer.

Two versions of the card are available: The Arcade Duo and the Arcade Pro

This isn't the first time Engine CD-ROM owners have been called upon to upgrade. The Super System card released at the same time as the Duo was an expensive but necessary addition that allowed the old CD-ROM² system to play newer (and better) Super CD-ROM² games. Unfortunately, though, this card is now redundant. According to NEC, an adaptor was planned but the expense was greater than the cost of including the Super System card's features on the Arcade Pro card itself. Which is exactly what has been done.

Naturally, NEC are counting on compatible software being available. Out the same day in Japan was Hudson Soft's *Garrou Densetsu 2* (*Fatal Fury 2*), closely followed by *Ryuukoo No Ken* (*Art Of Fighting*), with *World Heroes 2* and *Fatal Fury Special* coming later.

The rationale behind the new system is all too obvious. Giving programmers more RAM to work in (eight times more in this case) means the current ranks of graphically intensive arcade fighting games won't go marching past the ageing console. In fact, the SNK deal by itself probably justifies the investment.

But does it mean an extended lifespan for the PC Engine? Thirdparty licensees aren't so sure. Of NEC's many contracted publishers, currently only six – Hudson, NEC Avenue, Human, Microcabin, Nihon Telenet and Artdink – are working on Arcade Card titles. Other companies, including Konami, Mediaring and Irem, are unwilling to comment, possibly due to uncertainty about the willingness of PC Engine owners to shell out for yet another upgrade. **E**

Who is it?

This self-confessed hippie started programming in the late '70s, producing such games as *Gridrunner* (VIC 20), *Revenge Of The Mutant Camels* (Commodore 64), and *Llamatron* on the ST. Ultimately, he's a true Atari believer…



***Fatal Fury 2* (top) is out now for the Arcade Card, and the previously unreleased *Strider* makes its debut**

PC Engine Arcade Card release schedule

12 March
Fatal Fury 2 (Hudson Soft) ¥6900
26 March
Art Of Fighting (Hudson Soft) ¥6900
March
World Heroes 2 (Hudson Soft) ¥6900
May
Strider Hiryu (NEC Avenue)
July
Fatal Fury Special (Hudson Soft) ¥6900
No dates yet
Pop'l Mail (NEC)
3X3 Eyes (NEC)
Sak3 (NEC)

i wish…

Phil Harrison

'**1.** There were only two magazines: **Edge** and Wired. With these sources, of information, who needs TV? Unless…

2. My television and computer were a single unit. I could tell my TV what programmes to show, when and in which room of my house. And I don't want any adverts. Unless…

3. I decide which products and services are advertised to me. I tell my computer/TV that I'm interested in buying a new car, for example, and it passes that request to advertisers. In response, they show me targeted adverts for products I actually want to buy (there's a novelty). In fact, I'll charge advertisers for the privilege of entering my multimedia space and they can pay for movies on demand, rather than me forking out. Unless…

4. Art, media and information become public domain via the Net, which will cost me a fortune to access. Unless…

5. Governments get on with running countries and stop becoming meddling, bureaucratic impediments to the Digital Information Super-Highway, Digital Infobahn or whatever. And…

6. People stop inventing buzzwords like Digital Super-Highway, Digital Infobahn, Multimedia, Interactivity, Edutainment, Infotainment. Unless…

7. The only buzzword is Entertainment and it's made only by a small number of select companies…

8. Sony, for example.'

Phil Harrison is the director of product development for Sony Electronic Publishing

3DO: lower price higher **profile**

With their 3DO struggling, Panasonic start to get serious...

it is...
Llamasoft's Jeff Minter – a hippie, farmer and programmer living in South Wales. Recently, Jeff has been working on Atari's Jaguar; the result of his efforts is *Tempest 2000*, a reworking of the classic Atari coin-op

Panasonic have announced the launch of a series of 'aggressive marketing programs' for their version of the 3DO, the FZ-1 REAL Multiplayer. But whether this is part of a preconceived business plan or simply a kneejerk reaction to the slow progress of the machine in the marketplace is open to question.

According to **Ted Inoue**, president of the US division of Panasonic, 'The Christmas selling season was a strong one for Panasonic and our new multiplayer. We look to continue this momentum in a variety of ways. A second mall tour will increase consumer awareness, and aggressive pricing, new software and video CD capabilities will help further establish this innovative product.' The tour of American shopping malls is now well under way, and over a period of two months will wend its weary way through ten cities, introducing shoppers to the delights 3DO has to offer.



With launch of the product imminent in both Japan and Europe, Matsushita Electric Corporation Of America – Panasonic's parent company – have ramped up their production of the FZ-1 and improved their production technology, allowing the price of the unit to be reduced. As of February 18, all 3DO systems cost $499.95 – around £300.

The dismal 3DO software situation is about to be eased somewhat, too, with the release of the first of EA's efforts, plus a dozen or so new titles from Panasonic themselves. The first Panasonic-branded discs destined for the US have been coded in Japan. They include *True Golf Classics: Pebble Beach Golf Links*, a conversion of T&E Soft's SNES game; *REAL Pinball* from Japan Data Works; and *The Life Stage: Virtual House*, Microcabin's interior design program. These titles will be available in March/April, with a price tag of $59.95 (£40), and a fourth Panasonic title – *True Golf Classics: Waialae Country Club* – will follow in mid-summer. ➔





***Wacky Races* (main), *Ultraman* and *Takeru* for the Japanese 3DO. Titles with Kanji text support will have problems running on US and UK 3DOs**

3DO release schedule

February/March 1994
Dennis Miller: That's News To Me
The Horde
John Madden Football
Life Stage: Virtual House
Out Of This World
Sid Meier's CPU Bach
Sewer Shark
Pebble Beach Golf
Twisted: The Game Show
ToonTime: In The Classroom
Woody Woodpecker cartoons

April/May 1994
Cowboy Casino
ESPN Baseball
The Even More Incredible Machine
Jurassic Park Interactive
Lower Your Score With Tom
Kite: Shot Making
Microcosm
Silly Classix: At The Museum







The first Panasonic-branded titles destined for the US are (from top) *Life Stage: Virtual House*; *True Golf Classics: Pebble Beach*; and *REAL Pinball*. All three discs have been coded in japan

← 3DO's MPEG1-standard FZ-FV1 Video CD Adaptor will also hit stores sometime over the next few months, retailing at $249.95 (£150). No firm details about compatible software are available yet, but EA's *Shock Wave* and *Road Rash* were on show at the CES running MPEG intro sequences. Not, perhaps, the most exciting of deals.

3DO's UK launch draws ever nearer, with 3DO announcing the opening of a UK office and a latest provisional release date of May. The new price structure in the US means that the PAL machine will go onsale for less than £500 – substantially less, according to some sources. Panasonic themselves state that the final price depends very much on the excise duty imposed by UK Customs.

ZCL have been appointed as official distributors, tasked with supplying 3DO units to 700 independent dealers, while Panasonic themselves will use their traditional distribution network among high-street retailers – although this is currently under negotiation and Panasonic are being tight-lipped about the whole business.

Taking a leaf out of the US operation, Panasonic are planning a 3DO roadshow to demonstrate the hardware in over 50 shopping malls – sorry, centres – in the UK, with back-up from a nationwide press advertising campaign and TV ads to follow later.

When the UK FZ-1 finally rolls out, there should be between 30 and 40 titles initially available for it – although most, if not all of them, will be NTSC titles, running in letterbox display on PAL machines. And while the US machine came bundled with the adequate *Crash 'n' Burn*, Panasonic are currently reconsidering their bundling options – **Edge** reckons they should dump *Crash 'n' Burn* in favour of *Road Rash* or *PGA Tour Golf*.

The flow of 3DO software is steadily increasing from a dribble to a trickle (although with a purported 550 licensees worldwide, it should be a good deal more than that).

The latest release schedule offers 22 new titles between March and May. Among such oddities as Woody Woodpecker cartoons and *Lower Your Score With Tom Kite* there are some gems, including *The Horde* (Crystal Dynamics), *Sewer Shark* (Digital Pictures), *Twisted* (EA), *Out Of This World* (Interplay) and *Jurassic Park Interactive* (Universal Interactive Studios). Plus the infamous *Microcosm* (Psygnosis). E

Panasonic



Over the wire

A regular spot where Edge reports on how technology will shape the news of the not-too-distant future...

...07:04, 19/04/97 via Reuters Newswire

While insurers continue to dispute several claims of 'neurological damage', another global entrepreneur is undergoing psychiatric tests, this time at a clinic near Chicago.

Cory O'Pirule, Director of TransNet, Inc, is the latest victim of a virus rampaging unchecked through global teleConferencing networks. Network controllers deny the existence of such a virus, but 'sightings' are now being reported daily.

O'Pirule had been meeting with three other colleagues in a 'virtual boardroom'. Like many companies, TransNet uses teleConferencing as a cheap alternative to physical meetings with overseas colleagues. These 'meetings' are held face-to-face in a virtual environment.

This illusion is made complete by the human brain's ability to adapt to new sensory input. The individual dons a headset giving wraparound audio and visual input, and a combination of 'intelligent' software and built-in electromagnetic probes 'guide' the individual's mind into a receptive state. The VR headset adjusts its input a thousand times a second until its sensors tell it the users believe what they're sensing.

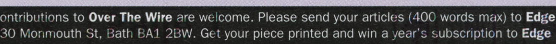
The VR teleConferencing headsets not only induce this alternative reality, they are also programmed to return the user to normality afterwards. As a rule, this happens naturally once the headset is removed, but the period of disorientation can be minimised by 'reverse-programming' the individual.

It's this reverse-programming that has been attacked by the Saddam neuroNet virus. Victims have experienced much longer periods of disorientation than usual, together with hallucinations and even permanently changed perceptions of reality. A report leaked from O'Pirule's clinic suggests that he believes he can fly. This belief is not a superficial - and treatable - psychological malaise. It is as deep as the conviction that he can walk.

Dr Galen Turing, head of neuroComputing at CambColl UK, voiced the fears of many on primetime TV last night: 'It was only a question of time before programmers found out how to interface with the human mind. And it was from there simply a question of time before they learned how to program it.'

Meanwhile, the headset's manufacturers are anxious to play down the ability of these devices to permanently modify the activities of the human brain. 50 years ago such a discovery might have earned them a Nobel prize. Today it could mean the biggest lawsuit in history...

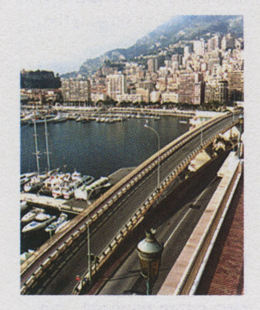
...transmission ends...


Contributions to **Over The Wire** are welcome. Please send your articles (400 words max) to **Edge**, 30 Monmouth St, Bath BA1 2BW. Get your piece printed and win a year's subscription to **Edge**



This Month on Edge

A heady concoction of rumour, late news and minutiae, distilled and blended by **Edge**



Sunny Monte Carlo, setting for the Computer Arena '94 conference

Each year, the computer and videogame industry holds a conference in which specific topics are discussed at length. This year the venue was Monte Carlo in Monaco; **Edge** was in attendance.

After two days of conferencing, 680 minutes of dialogue and 23 speeches, the general feeling was one of confusion and disillusionment. The market is very flat at the moment, with cartridge sales down, discounts up, and customer interest apparently on the decline – and this situation looks set to continue over the summer.

However, it wasn't all doom and gloom: the nascent hardware platforms should give the market a shot in the arm for '95. And in the meantime, the PC continues its march into homes across Europe, with prices continually falling and power on the increase – Intel intend shipping over a million Pentium chips this coming year.

But the most important thing is that **Edge** managed to win 350 francs (£43) on the roulette wheel.

The latest rumour in Japan is that Nintendo have several new hardware projects in progress. As well as news of a handheld version of the 8bit Famicom, there are whispers of a CD-ROM drive for the Super Famicom – which could be unveiled at the Famicom Space World show in August. Watch this space...

Atari's Jaguar CD-ROM drive is currently shrouded in secrecy, mainly because the final specs haven't yet been determined. Some developers are being asked what features they want to see, and there is even speculation that Atari might be including a texture-mapping chip (something it could certainly do with) to beef up the system in the face of new competition. An Atari development conference is scheduled to take place after the ECTS.

Will the basic Jaguar soon be supplemented by a CD-ROM drive with an extra graphics chip?

This issue's review of *Tempest 2000* nearly didn't happen: the single pre-production ROM in Atari UK's possession was constantly unavailable due to massive demand – managing director Bob Gleadow's kids had it at home to play over the holidays. In the end we got hold of a packaged copy at the last minute – and even before Jeff Minter got his.

In the wake of a slightly disappointing 2nd Future Entertainment Show, Future Publishing has now retargeted the event, which now goes by the name of Future Computing '94.

The show has shed its glitzy games angle to become an all-formats affair, embracing all machines, including the



Sigeru Miyamoto, Nintendo's videogames hero. (Endorsement of Edge by Mr Miyamoto is in no way implied by this photograph, incidentally)

Edge recently saw a demonstration of a new operating system called Taos (pronounced 'dow-os'). This hardware-independent, heterogeneous parallel processing language might be a major step forward in the battle against incompatibility and obsolescence. Full details in Edge 9

new platforms, and covering emerging technology like CD-ROM and FMV.

It is to feature hands-on displays, plus demonstrations and workshops hosted by Future Publishing's editorial teams. With an earlier venue date of 26-30 October, FC94 is all set to be the main event for the interactive entertainment industry.

Some encouraging news for PC owners: Argonaut are working on a 3D graphics card specifically designed to render polygons at high refresh rates. No news on how powerful it will be or its proposed cost as yet.

Forgotten Castle – the only PC game to surpass *Doom* in the looks stakes – has been canned as a result of its development company, Twin Dolphin Games, going into liquidation. Several companies are now interested in picking it up.



(From left) Chris Hinsley, Tim Moore and Francis Charig from Taos Systems – are these men about to change the shape of videogaming?

Sega have relied on shock tactics once again, announcing that they will not be present at this Summer's CES in Chicago. Instead, they will be hosting their own plush convention in Disney World, Florida, with developers getting their own hotel suite for... $25,000. This news comes at the same time as speculation suggesting that Nintendo's traditionally quiet period is about to take an upswing. The company is expected to have four new SNES games on display at CES – of which two will be Super FX titles and one will be a follow-up to *Super Mario World.*

Three Project Reality games are thought to be in development already at NCL's Entertainment And Analysis Department. *Zelda*, *Metroid* and *Mario 5* are apparently being worked on, with *F-Zero 2* on the drawing board.

Jaguar CD games: Rebellion are preparing to release a CD version of the 3D dungeon game first talked about in **Edge** 4; Imagitec are planning to release *Freelancer* for the Jaguar's CD drive; and ATD have *Battlemorph*, sequel to *Cybermorph*, winging its way onto the CD-ROM, featuring texture-mapping, trading elements and more structured gameplay. And Argonaut will have the rather slick *Creature Shock* on a silver disc for Atari as well. Also, **Edge** has heard that *Syndicate* and *Theme Park* will soon be making their way onto the Jaguar, courtesy of a major UK publisher.

A Tokyo-based publisher is releasing a book in April about the Japanese games industry and its position in the multimedia world. Selected opinion makers featured in the book include David Sheff (author of the Nintendo story, Game Over), Sigeru Miyamoto (Nintendo's executive game producer), Mr Irimajiri (VP of Sega Enterprises), and **Edge** (the future of interactive entertainment). Shame it will only be available in Japanese.

Expect a stunning CD-ROM game, *Heart Of Darkness*, to be unveiled at next month's ECTS. Paris-based Amazing Studios, headed by Frederick '*Flashback*' Savoir and Eric '*Another World*' Chahi, are reputed to have created the most stunning animation yet seen.

Edge has just heard that Philips' CD-i will be bundled with a digital video cart and *Caesar's Boxing* for an extra £50. Which puts it, pound for pound (and dodgy game for dodgy game), roughly on a par with Commodore's CD32.

Sources close to Konami have hinted that *Contra* for the Mega Drive will be better than the SNES version but have less variety, mainly due to the Mega Drive's lack of rotation and scaling facilities. Still, the game is already looking better than the company's lacklustre conversion of *Castlevania* for the Mega Drive.

SNK are introducing a re-designed Neo-Geo this year. Same performance, lower cost, and the mumblings about a CD-ROM drive continue.

Finally, *Virtua* *Fighters 2* is on the way, with texture-mapped, smooth-shaded fighters, two new characters (a Thai boxer and an American ninja) and weapons as well.

A Future Publishing editor recently had the pleasure of interviewing Sigeru Miyamoto at Nintendo's headquarters in Kyoto. When handed a copy of Edge 6 for his perusal, Miyamoto-san took one look at the cover and was heard remarking, 'Ah, Steve Jarratt-san'. In return, our esteemed (and now very big-headed) editor sends his regards to the greatest game designer of our time

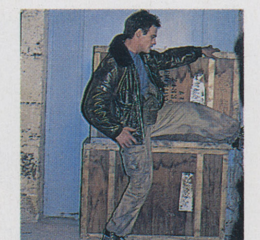


Youthful French filmmakers Nic Mathieu and Greg Glachant

Virgin are currently shooting film footage in Paris for a game with the working title of *Scavenger*, consisting of an ambitious marriage of digital video and action. Edge was invited for an exclusive sneak preview.

The most interesting thing about the production, apart from its scale, is the fact that it is written and directed by two 16yearolds, Nic Mathieu and Greg Glachant. Developers Cryo were approached by the lads with an impressive home-produced video of their own game concept, and decided it was simply too good to turn down.

Basically, what *Scavenger* is trying to do is become the first interactive movie that actually works, taking the *Mad Dog McCree* approach and turning it on its head. Targeted primarily at PC CD-ROM, it is due late '94.





The lead actor struts his stuff (top). Filming in progress (above)

viewpoint

Write to: **Edge** letters, 30 Monmouth Street, Bath, Avon BA1 2BW. (Sorry, no personal replies)



Got an opinion? A question? Express yourself in **Edge** letters – the ultimate videogames forum

After reading the article on Atari's Jaguar in **Edge** 5, I could not help agreeing with the points made against Atari. In the past, Atari alienated thirdparty publishers and ended up destroying the promising ST software market. The same thing happened when the company brought out its high-spec machines. Commodore, on the other hand, gave a generally free rein to thirdparty developers and this secured the 16bit number one spot for them.

And now Nintendo seem to be making the same mistake. Due to the ridiculous pricing strategy recently employed by Nintendo, the Japanese giant is destroying its thirdparty market, which in the future (Project Reality) could cause severe repercussions. By entering this market late, they will need all the support they can get, and this is certainly not the way to go about it. The two superpowers, Sega and Nintendo, are waging a fierce war that will last for at least another year, and Nintendo seem to be losing – it can be said that the SNES is already a dead machine. Nintendo's release schedule is less than awe-inspiring, being for the most part rehashes of old games from other formats.

What the future holds, only time will tell, but things do not look good for Nintendo owners.

Neil Hart, Manchester

Nintendo do seem to be strolling nonchalantly into the videogame wilderness. With Project Reality a good 12 months away, no hardware apart from the Super FX2 chip slated to appear in the interim, and few major game releases, it's going to be all quiet on the Nintendo front this year.

Conversely, the Mega Drive continues to dominate the 16bit market, and if Saturn is released on schedule Sega will be busy eating up the 32bit market while Nintendo forge ahead with their promising, but invisible, Project Reality. And there's also 3DO, Sony PS-X and everyone else getting in on the act.

Of course, no-one in their right mind would write Nintendo off at this early stage, but it does rather look as if the next generation has taken Nintendo by surprise…



Project Reality: 'Way Past Cool' or way past caring? (See letter from Neil Hart)

I woke up this morning to a report on the radio about the risk to today's youth of heart disease in later life due to lack of exercise. I'm sure this is perfectly true, but I was extremely annoyed when the British Heart Foundation blamed my generation's slovenly behaviour on 'children preferring to play computer games and watch the telly'.

Yes, these activities are undeniably non-active, but why does the emphasis have to be on computer games? Watching television takes up many more hours of the average kid's life (even one who owns a game system, and many don't). Surely it is television that should have been blamed first and foremost, whereas instead it takes a back seat to that evil of all evils, the videogame.

It is this kind of ambiguous information that leads to scaremongering and half-truths. Many people already seem to have got it into their heads that playing videogames will 'make' you epileptic. Firstly, epilepsy is innate – you cannot 'get' it; and secondly, it is the flickering display of the TV or monitor that can cause epileptics to have fits and not the games themselves.

How long before people ignorantly claim that playing a console game will give you a heart attack? I just hate the way older generations always condemn youth culture. My guess is that they do it out of insecurity, because they don't understand, rather than out of genuine concern.

Luke Harris, West Yorkshire

Fair comment: TV has been the cause of indolence since long before videogames came on the scene. It's ridiculous to attribute all society's ills to videogames; if



Videogames and TV – they both cause epilepsy, harden the arteries, and are the root of all evil. (See letter from Luke Harris)

someone was content to sit and read books for hours on end, for example, would they be accused of anything worse than expanding their mind?

However, it's a little harsh to condemn the 'older generation' for attempting – however misguidedly and hamfistedly – to protect youngsters from harm.

Why did you decide to give four pages to the article on Cryo? What they have done in the past does not matter; it is what they are doing now that counts. The problem is that what they are doing is complete crap. The idea of dragging images straight out of CD was used in the pretty-but-shit *Dragon's Lair*. Does a company really have to be rewarded for trying to drag CD-based set-ups back into Neanderthal times?

By the way, why can't Sega just come clean and admit that the Mega CD was a mistake, and that their rivals Nintendo were in fact correct in deciding that a 16bit system just can't cut it when it comes to CD?

Grant Taylor, Rosyth

We featured Cryo (**Edge** 5) because the French coders are genuinely trying to prove the worth of the CD format. Their titles are innovative, good-looking and, hopefully, a darn sight more playable than previous CD games. For the latest update on their work, check out this issue's Prescreen.

Get real: why would a company like Sega admit to making a mistake? Nobody else ever does.



With games like *TFX* (above) in the pipeline, the CD³² can at least boast some decent software. (See letter from Jonathan Sacramento)

I could have written to a biased single-format magazine, to be told only what I wanted to hear, but instead I've decided to write to the most respected and informative videogames magazine in the business.

With so many CD formats appearing on the market, I am spoilt for choice, and also hard-pressed. I want a good, not too expensive machine with a good future, as I do not want to buy something which will be discontinued in a couple of years' time. I'd like to say that I want to use it for something other than games, but I don't.

I was considering a CD³², but I'm going to sit back and watch if it grows. Meanwhile, I need some feedback, and who better to ask than the best?

Do Commodore intend to sponsor some games, and indeed, the much-awaited 'figurehead' for the Amiga CD³²? Tower Publishing claim that the CD³² is outselling the Mega CD in the UK by four to one. Is this true? How is the software support coming on?

Give me your opinion: if your income was low and you had to save up for yonks to buy a CD³², would you do so?

Jonathan Sacramento, Gibraltar

Commodore's CD³² has certainly surprised its critics by becoming something of a hot cake with regard to sales. It's true that the machine is selling very well, and also that sales of CD³² games have already overtaken Mega CD games (although that isn't too difficult).

Edge has yet to see any truly impressive, dedicated software for the CD³², but there are plenty of titles on the way, such as *Guardian* (Prescreen, **Edge** 7), *Inferno, TFX*, and *Rise Of The Robots*.

To make up your own mind about the CD³², see our feature on page 42.

I have a short story to tell you – an allegory, if you like.

Once upon a time, in Slough (a small town near Windsor), wristwatches were very popular – indeed, nearly three quarters of the populace possessed one. Certainly, the wristwatches had their share of problems: many claimed that they were too expensive; others complained that they didn't keep time accurately enough. But Mr Lewis, the sole producer of fine timepieces, shrugged off such complaints, saying: 'Where would you get such watches if it wasn't for me' and insisting that he couldn't sell them for any less.

Unfortunately for Mr Lewis, Mr Barker, the jeweller from the neighbouring town, came to hear of the enormous watch market in Slough and, seeing a chance to double his income, sold his shop in Windsor and started a new watch business. Three doors down from Mr Lewis' store. Several other watchmakers also noticed the opportunity, and soon there were ten new businesses in the town, each of them promising a watch far superior to those of his competitors: Mr Barker's watches were by far the shiniest; Mr Jones' were the most accurate; Mr Barnes' were the most colourful; Mr Dean and Mr Mellerick formed a partnership and produced watches that played a little tune every hour. In fact, all the new watches had their good and bad points.

The watch industry in Slough thrived for several months. In fact, more people were wearing watches than ever before. The problem was that with so many watchmakers, profits were fragmented and no business was selling enough watches to cover the cost of production. Gradually, one by one, the factories disappeared from Slough. No-one was left to maintain or repair broken watches, or to provide new batteries. To this day the watches remain in houses all over Slough, unused and obsolete, a reminder of a wasted new technology…

The future of videogames?

Gerald Donovan, Slough

Recently I borrowed a book from my local library entitled Computer Games. It was printed in 1980, and as well as including tips for the latest games, such as *Pac-Man, Space Invaders* and *Missile Command*, it gave an interesting insight into what the author thought computer games would be like in ten years' time (1990). It was generally very accurate – 'home television games with picture-quality graphics, colour handheld games with interchangeable cartridges, fourplayer games and digitised speech' being examples.

One of the other points was: 'By the year 2000, it will be possible to play computer games against people living in other towns and cities, through the use of an attachment for your home television console.' I think



Cryo's *The Lost Eden*: state of the art videogaming experience or graphical frippery? (See letter from Grant Taylor)

Continued next page

PC-based modem games have been around since the mid-'80s – am I right? However, the book was 15 years out of date on the subject of modems.

The point is that videogames seem to be constantly getting better, with flashier graphics and more memory all the time. I recently read an interview in which the boss of Sega Europe claimed that it wasn't too long until games appeared which weren't controlled by your hands, but your mind. Isn't this taking things a bit too far?

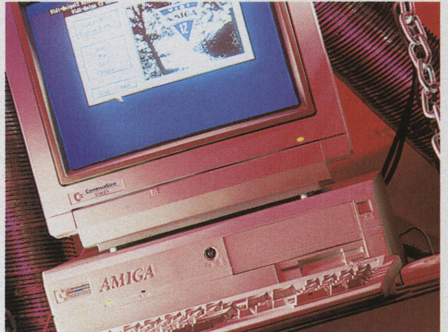
Matthew Withers, Crewe

When the author of Computer Games talks about 'connectivity', it doesn't sound like he has modems in mind – certainly not the user-unfriendly gadgets that are usually the domain of PCs and Amigas. His vision is far wider reaching: he's talking about using set-top boxes to play against people all over the country via the cable TV system. And it will certainly take another few years to get this technology into front rooms across the UK.

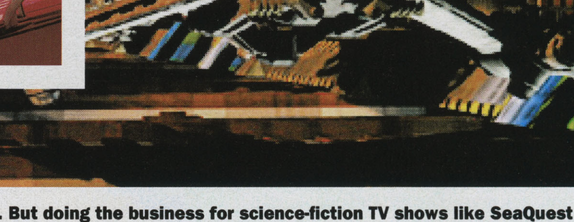
If you think about it, you already play using your mind – your hands and arms are just joystick extensions – so what Nick Alexander (head of Sega Europe) said isn't that outlandish – although the technology is years away yet.

You talked in issue six about PCs and SGI graphics workstations as the two main choices for 3D rendering. I'm curious, though: aren't there other systems available as well, particularly the Amiga Toaster 4000? The Video Toaster is probably the most powerful yet cost-efficient way to produce 3D effects. The software used (*Lightwave 3D*) is responsible for the special effects for TV shows like SeaQuest DSV, Unsolved Mysteries, Babylon 5, Quantum Leap and many others.

The new 'Screamer' by NewTek (makers of the Video Toaster) is used by the likes of Steven Spielberg and is a rival for SGI workstations at a fraction of the cost. For as little as $2,500 you can have a system much more capable than its PC counterpart. Even a simple Amiga system (using an Amiga 3000 and a program called *Imagine*) created the 3D effects in EA's first CD-ROM game, *Labyrinth In Time*.




The Amiga workstation: relatively unused in the games industry...



... But doing the business for science-fiction TV shows like SeaQuest DSV and Babylon 5 (above). (See letter from Brian Inthof)

Believe me, this is not just another 'Amiga is better' letter. But I, like many people who work with the computer, tire of seeing so much credit given to the ubiquitous PC, a machine whose architecture has been forced by massive speed, RAM and chip upgrades to do what other machines do better and more cheaply.

Brian Inthof, Ontario, Canada

Certainly, the Amiga is the other serious option. But we were talking about rendering images for use in games, and while the Toaster-powered Amiga is being widely used by TV and special effects companies, it simply has not been adopted by the games industry. Perhaps designers rendering on expensive Silicon Graphics systems should take note?

I am writing about the interview in **Edge** 6 with Archer MacLean, particularly the bit where **Edge** asks him which new machine is going to make it big.

He said: 'I can't breach confidentiality,' but he knew in his own mind the machine he thought was unbelievable, because he had seen it and played on it, and he then went on to say how powerful it was.



Archer MacLean keeps stumm about future hardware. (See letter from Stuart Patterson)

I respect the fact that he can't tell the readers the identity of the machine, but what I'd like to know is what **Edge** thinks/knows it is. I get the impression that this machine might be something unheard of, since Sega, Nintendo and Sony have all said in one way or another that they are working on and developing systems. We have seen screenshots from Sony's PS-X and Sega's Saturn and Nintendo are still working on their machine with Silicon Graphics, so they don't yet have a working machine. This takes care of the big companies that can afford to take on this market. Two other projects known are the Hudson/NEC partnership and the TXE Multi System (see **Edge** 7).

Since we already know of such systems and other machines are already out (for example, 3DO, Jaguar, CD^{32} etc), why would Mr MacLean not reveal the name of the machine he was talking about?

Stuart Patterson, Dundee

The machine Archer was talking about is indeed one of those **Edge** has already revealed. However, under a signed Non-Disclosure Agreement – or NDA – Archer simply was not allowed to furnish any specific information – it is literally more than his job's worth. Rest assured, though: most of the systems **Edge** has seen are looking very impressive.

After reading issue two of **Edge**, particularly the article CD-ROM: The Truth, I was set to considering my own choice of console. The CD-i seemed an attractive purchase but its lack of success seemed likely to continue. The Jaguar, by issue five, seemed very attractive, but the general lack of enthusiasm and the fact that it is cartridge only put me off. Then, of course, there is the 3DO – the dream machine. The games look flashy, there are hundreds of developers and it is CD based. However, the sheer expense of the machine put me off.

I bought a CD^{32}. A puzzling choice, you may think, but despite its lack of hype and a bad TV commercial, it has not really had a bad press. It hasn't got the greatest tech specs, but it does have a solid and increasingly original base of software, and the joypad is well designed.

There are over 70,000 of us now and even if you fail to mention the CD^{32} in most areas, please voice your opinion on it in reply to this letter. Finally, I would like to say that I do not feel prejudice towards other consoles, but I think that one-upmanship amongst their owners is getting a bit too lively.

James Rossignol, Kent

The CD^{32} is by no means a bad purchase. It may not have the top specs of other machines, but at least it's here and has a library of decent – if unoriginal – software. But if you think one-upmanship is rife, wait until the end of the year...

Road Rash 3DO **F1 Championship** Mega CD **Inferno** PC **Lobo** Jaguar **Apeshit** Jaguar **The Shadow** Jaguar **Aliens Vs Predator** Jaguar **The Lost Eden** PC **Top Hunter** Neo-Geo

Prescreen



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Many people – including Namco in Japan – noticed our slight technical faux pas with last issue's Prescreen of *Road Rash*. And rather than leave you wondering why EA's 3DO title bears an uncanny resemblance to *Ridge Racer*, we've revisited the game – new details and shots of *RR* (the right one) appear on the next page.

And the race games keep coming thick 'n' fast, with a new Sega title for the Mega CD. Enigmatically subtitled *Heavenly Symphony*, this F1 racer certainly looks impressive – but whether it can outpace *Virtua Racing* (Testscreen, p82) remains to be seen.

This issue also contains updates on DID's *Inferno* and Cryo's *The Lost Eden*, which can be found cluttering Edge's otherwise pristine pages. Both games prove that when it comes to visuals, the PC takes some beating (especially when images have been prepared in advance and are then simply played back on cue). E

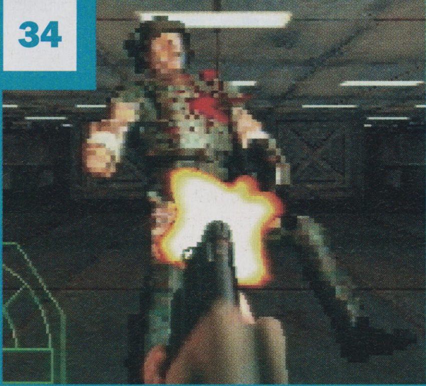
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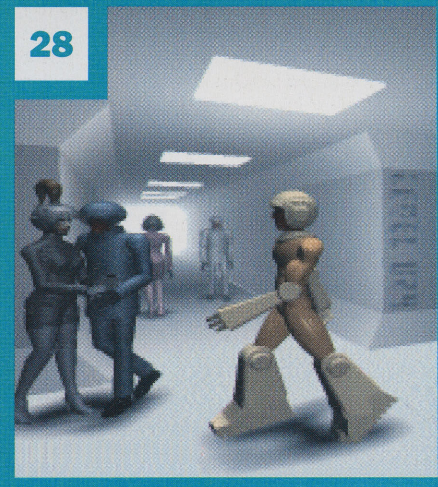
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Road Rash

Electronic Arts are often accused of flogging old rope. But in the case of 3DO *Road Rash*, **Edge** finds them not guilty

'In the 3DO version, the opponents are more intelligent: they remember if you attack them...'

Format:	**3DO**
Publisher:	**EA**
Developer:	**In-house**
Release date:	**May (US)**
Size:	**1 CD**
Origin:	**US**

Thanks to an unforeseen technical glitch, last issue's Prescreen of *Road Rash* turned into something of a scenic tour of *Ridge Racer*. However, that merely gives us a good excuse to look at Electronic Arts' tyre-screeching racer in more detail.

3DO *Road Rash* was coded by the same team that created the original Mega Drive versions. **Edge** spoke to **Randy Breen**, producer of all three versions of *Road Rash*, about the new features in the 32bit game.

'There are reactive objects – specifically, pedestrians that walk across the street,' explains Randy. 'They're basically animations that have some intelligence. If you hit them they fall over and some have limited attacks. For instance, the businessman swings his briefcase at you.'

Using the same format as *Road*





There are 15 different cars in *Road Rash*, from a silver Porsche (inset) to yellow taxicabs. The mechanics of 3DO's sprite scaling only become apparent at close range













The heavy-metal *Road Rash* intro: on the CD there are around 40 FMV sequences, comprising 25 minutes of video and 14 songs



You can either play *Road Rash* with a motorbike-style dash (above), or opt for a clutter-free full screen (right). Speed differences are negligible



As with previous *Road Rash*es, hitting an incline at speed causes your biker to become airborne. Just don't do it at busy intersections...

Rash I and *II*, the game consists of five courses and is basically just a race to the finish. However, there are also several levels of play: 'As you move up in level, the races get longer,' says Randy, 'but you have to qualify in each course before you go to the next level.

'The speed of the bikes also increases, so it becomes more competitive in that sense, and traffic is increased as you go up in level.'

The upgradeability aspect of the game has also been expanded, with 15 different bikes, which get progressively more expensive. There are also intermediate upgrades, such as performance enhancements, and protection upgrades, like improved leathers and helmets, enabling you to take more damage.

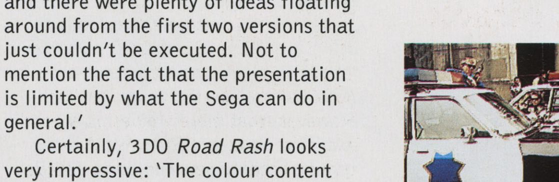
The 3DO's hardware has also allowed the programmers to improve their code: 'In the 3DO version, the opponents are more intelligent – they remember if you attack them, and different characters have different personalities, in that one person might retaliate differently, one may take longer to retaliate, and so on.'

But why do a 3DO version in the first place? 'We talked about wanting to do a driving game on the 3DO,' Randy explains. 'We explored other ideas, but we were confident we could build the best product we could





In the finished version, skilful bikers will be able to power along the pavement, scaring pedestrians



conceive at the time by building from *Road Rash* – the Sega is very limited and there were plenty of ideas floating around from the first two versions that just couldn't be executed. Not to mention the fact that the presentation is limited by what the Sega can do in general.'

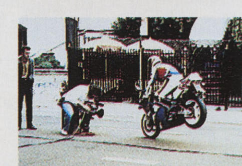
Certainly, 3DO *Road Rash* looks very impressive: 'The colour content and the sheer number of objects the 3DO can move around and scale is what makes the city course, for instance, so much more detailed than what we could do on the Sega. Beyond that, just having a CD allows us to do the music videos that we wouldn't have been able to do otherwise.'

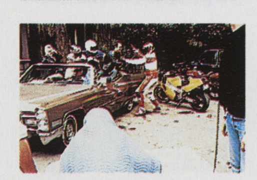
Presentation – specifically the use of FMV – plays a major role in *Road Rash*, as Randy confirms: 'The version shown at CES had maybe five video elements out of 40, so there's quite a lot more variety.

'There are also two intermission videos that are full-length music videos. We took band footage and mixed it with motorcycle footage that we'd shot. If the person leaves the controller alone for a while the music video starts up and it sort of becomes background entertainment.'

Road Rash has been in development for 15 months, with another two months before it is complete. But from what **Edge** has seen, background entertainment it ain't. **E**







The video sequences for *Road Rash* involved a team of 40 people working for two months, from scripting to post-production

F1 World Championship 1993 Heavenly Symphony

Sega agreed to program a game using visuals supplied by Fuji from coverage of the 1993 F1 World Championship

Format:	**Mega CD**
Publisher:	**Sega**
Developer:	**In-house**
Release date:	**April (Jap)**
Size:	**1 CD**
Origin:	**Japan**

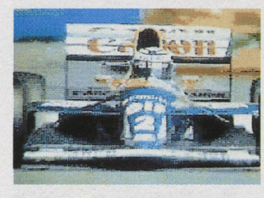
Edge has the first pictures of a Sega game that should silence the death knell of the Mega CD. For a while...

It's not unreasonable to say that Japanese Mega CD games, with the honourable exception of *Silpheed* and *Sonic CD*, have been extremely disappointing. It's almost as if talented Japanese developers have steered clear of the format altogether, and Sega's lack of in-house commitment only seemed to be hastening the machine's widely predicted demise.

So there's nothing more likely to bring a smile to a Mega CD owner's face than a new racing game from Sega themselves. *Formula 1 World Championship 1993*, ludicrously subtitled *Heavenly Symphony*, is the result of a deal between Sega and Fuji Television announced last October, in which Sega agreed to program a game that would include exclusive visuals supplied by Fuji from their coverage of the 1993 Formula 1 World Championship. Every major event from the 1993 series is expected to be



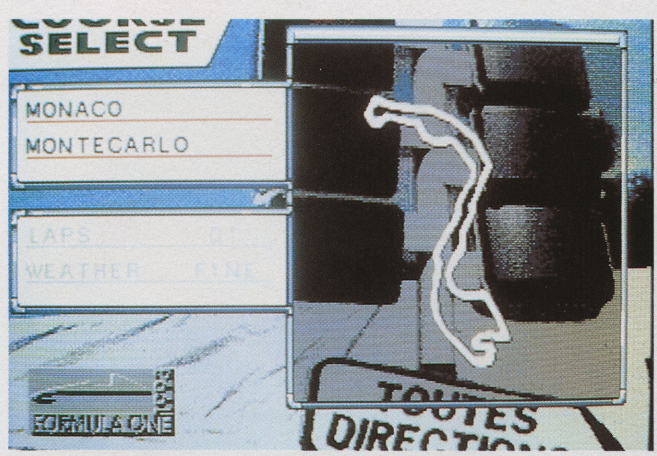
Frank Williams – among other top team managers – appears frequently with advice in fluent Japanese

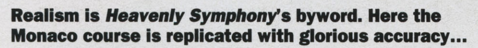


Video footage plays a major part in *Heavenly Symphony*, with lovely, if slightly predictable, images like this



With the stunning-looking *F1WC: Heavenly Symphony*, Sega – helped by Fuji TV – have themselves provided a judicious shot in the arm for their flagging CD format





Realism is *Heavenly Symphony*'s byword. Here the Monaco course is replicated with glorious accuracy...



... And not merely in the twisting course map: roadside scenery is also present, providing what at first sight looks to be the nearest thing to F1 racing on any console

included in the finished game.

There are 25 different cars featured in *Heavenly Symphony* – the Williams, McLaren and Ferrari teams are all represented – and the design and performance of each is accurately replicated. There are also 16 different circuits, including the perennial favourites, Monaco and Suzuka – Sega enlisted the help of a well known Japanese Formula 1 journalist to ensure that this aspect was as realistic as possible.

The game has two modes: GP Mode and '93 F1 Mode. The first takes place in a real season, emulating all the details of a proper racing schedule, and the second is accurately based on Formula 1 scenes and incidents that took place in 1993. Each mode has a wealth of options and strategies available for you to choose from, providing a further layer of authenticity and detail.

Heavenly Symphony uses the same 3D scaling graphics as seen in *Thunderhawk* and *Sonic CD*

From these initial shots at least, it appears that *Heavenly Symphony* uses the same 3D scaling graphics as seen in *Thunderhawk* and the bonus game in *Sonic CD*. Although the Mega Drive can't handle this kind of thing at the same rate as the SNES can with its Mode 7, it's still a good deal faster than relying on the Mega Drive's 68000 chip. In fact, it's surprising that no-one has attempted this kind of racing game before on the machine.

Despite the large amount of Japanese text – the racing action is supplemented by comments from famous journalists, technicians and team managers – *Formula One World Championship* looks like it might have the necessary credentials to update that ageing Mega Drive classic, *Super Monaco Grand Prix*. All we need now is an English version...

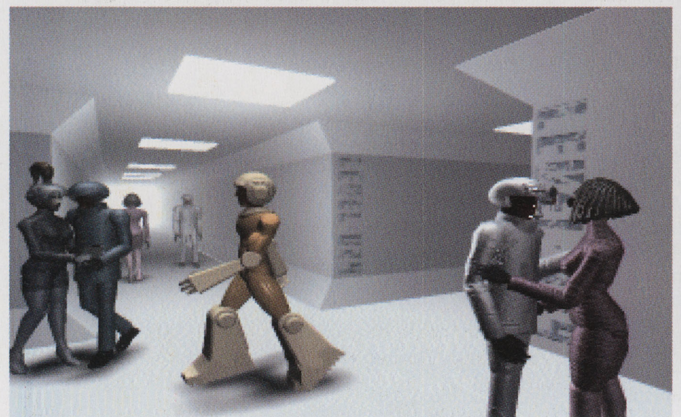


Attention to detail is apparent in things like the giant inflatable Mobil oil container that seems to visit most of the World Championship races



Employing a mixture of sprite and bitmap scaling, *Heavenly Symphony* looks gorgeous. And Sega *are* past masters of the racing game, after all

Rendered graphics like these are distributed throughout the game, but *Inferno*'s real speciality is fast, stunning realtime 3D polygons

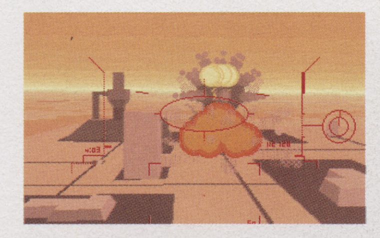


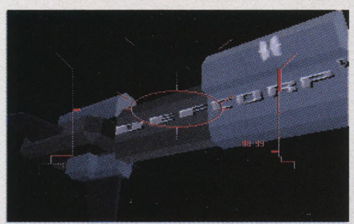


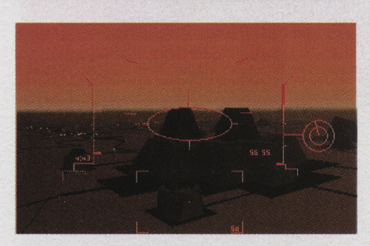
Inferno

Digital Image Design's new game has some of the fastest 3D graphics in the business. **Edge** reckons it's going to be hot stuff

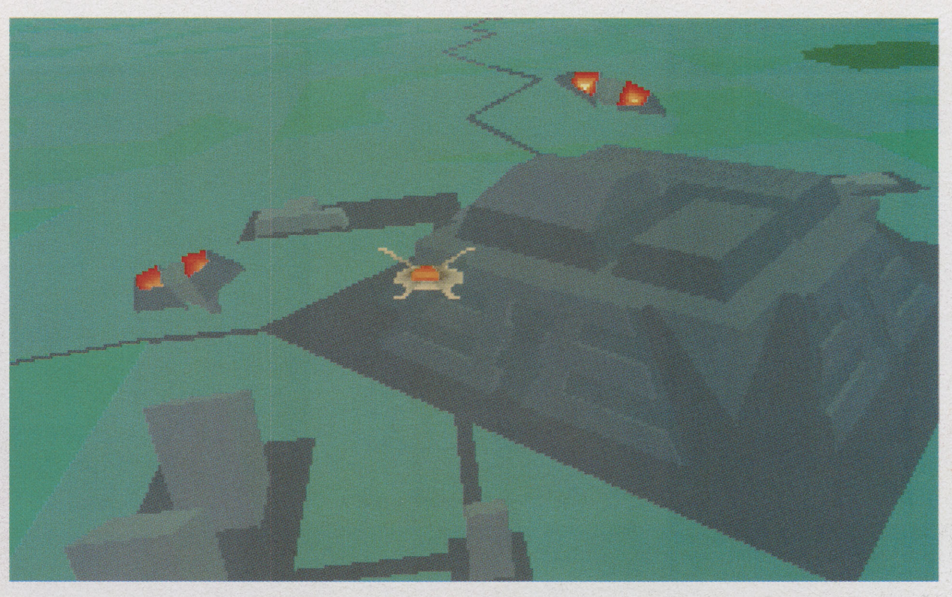
The goal of producing fast 3D is something that many programmers strive for but few achieve. DID, however, are one company that have managed to realise their aims. Their 3D engine has been constantly honed and improved over the last five years, and the results have never been more spectacular than *Inferno*, the







There's no shortage of impressive angles and effects in *Inferno*



Combat is an aspect of the game that DID have thought seriously about. The result is that powerful weapons are restricted to end-of-section boss ships, and fire power is kept in check throughout the game

company's latest and most ambitious project.

Although *Inferno* follows in the footsteps of DID's previous space game, the woefully flawed *Epic*, it's thankfully very different. In fact, it incorporates all the qualities of the company's highly applauded flight sim *TFX*, but adds better polygons, a large universe and a wide variety of missions.

Understandably, the *Epic* connection is something that Ocean and DID won't be advertising. According to DID, though, players who look hard enough will discover the original *Epic* ships deep within the game.

The game itself takes off two generations after the original *Epic*. The human race has established a civilisation in a new solar system which encompasses seven planets, three moons and – in true sci-fi tradition – a hostile force. *Inferno* can be played on three different levels – there's an arcade mode, an 'Evolutionary Mode', and the 'Director's Cut'. While the first speaks for itself, the second and third contain their fair share of surprises.

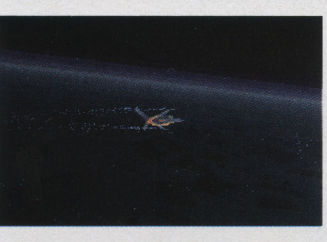
Evolutionary Mode is an open-ended scenario in which the player can determine the course of events (rather like in *Frontier*) and also influence the way the game ends. 'We've designed 700 missions,' elaborates game designer **Shaun Hollywood**, 'and from these we generate environments that may include up to 12 individual missions.' Rather than comprising laborious briefings after every objective, the plot tends to unfold in realtime as you play. One minute you're engaging

'We've designed 700 missions and generate environments with up to 12 individual sub-missions'

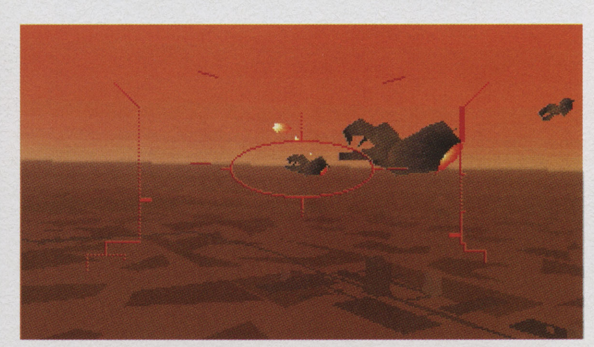
Shaun Hollywood, designer



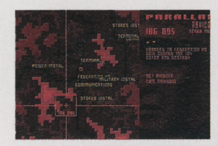
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Impressive fly-bys (left and inset) are a standard feature of most 3D sims, but the ones in *Inferno* are genuinely jawdropping, with the camera panning around as your Gouraud-shaded ship zooms by. The landscapes' depth of field and the design of the craft (right) are equally stunning





Navicom – your onboard computer – displays both a 2D and a 3D world



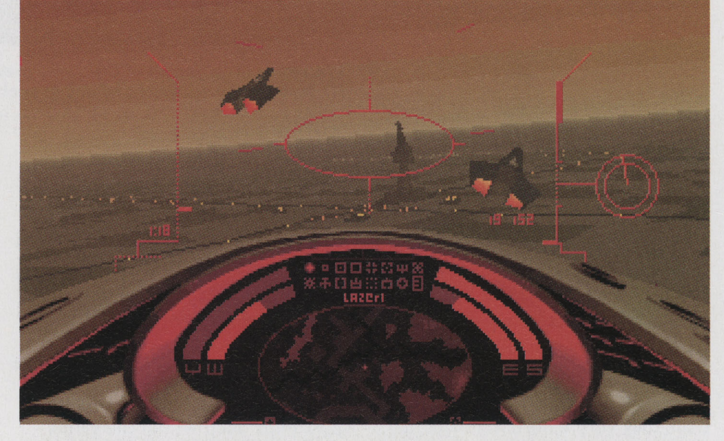
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in combat with aliens and the next you're defending space installations and navigating your way through complex mazes of tunnels with set objectives. 'It's the scale of it all that differentiates this from anything else this action-based,' claims Shaun.

The final option, the Director's Cut, is DID's attempt to give the player the best possible ride through the gameworld within a more linear framework.

Whichever option you choose in *Inferno*, shoot 'em up combat is obviously the game's overriding theme. However, as Shaun explains, certain environments provide natural extensions to the gameplay: 'There are so many different gaming ideas that aren't utilised yet in 3D so we've tried to make the game a hybrid and include elements associated with traditional sprite-based games.'

An example of this is in the interior sections of the space installations, where the gameplay seems to be on a number of different levels. You can navigate a maze of corridors and also, with the aid of your onboard computer system, see exactly where the aliens are coming from. 'You'll be flying around a true 3D environment,' adds Shaun, 'and yet the underlying mechanics will be of a *Pac-Man* maze game. Likewise, time restrictions induce real urgency into sections like these, as you desperately try to find the exit before the bomb that you've planted detonates.'



Your ship hurtles past a group of enemy soldiers on a bridge in one of the tunnels (top). You'd be forgiven for thinking this was an intro scene (above), but it's actually realtime – complete with light-sourcing for your ship's cockpit

The game's main character began life as a clay model and was then digitised

Of course,

such inventiveness and variety would be worthless without a decent graphics engine, and *Inferno*'s – created by Russell Payne – is guaranteed to knock your socks off. On a 486/33 it flies along at a fair old rate, but if you've got a DX2/66, prepare to be amazed. Like *TFX*, and unlike most 3D games, fully drawn landscapes extend far into the distance, giving a wonderful impression of depth. The detail can be configured to run on either 'low' or 'high', and on a DX2 the game often runs at over 20 fps, with about 22,000 polygons (10x10 pixels) being thrown around every second. To maintain speed, textures have been kept to a minimum, and yet in space you find some magnificent textured asteroids that scale with the smoothness of a Sega coin-op, and detailed lettering adorning the sides of cruisers.

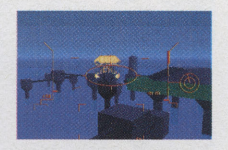
The sheer beauty of *Inferno*'s landscapes is complemented by

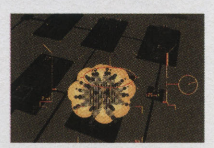


Photograph: Paul Michael Glazer

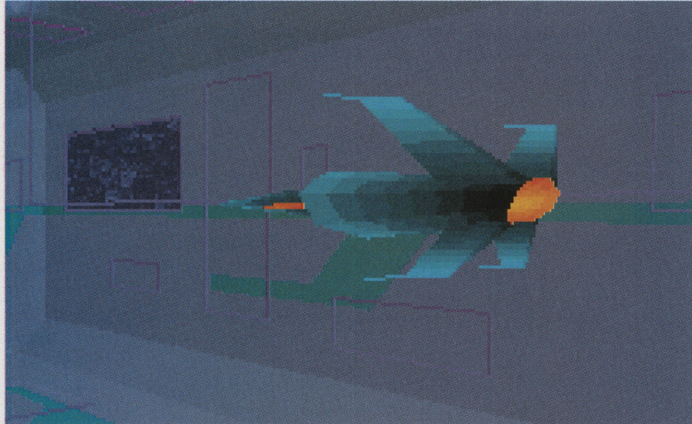
The Digital Image Design team, assembled outside their headquarters in Runcorn, Cheshire. Around 22 staff work here







Once they're launched, missiles can be tracked to give the best views



Emerging from beneath the water (top), our fighter leaves the sea base. In the tunnels (above), you can even flip your ship on its side to take corners

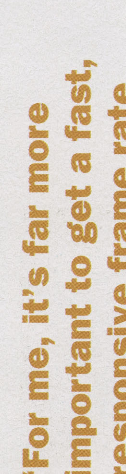
the variety of environments. On one planet you can fly below the surface of the sea (where icebergs extend below the water just as they should), guiding your ship through the tangled support structure of a marine installation, before shooting above the surface and dodging its superstructure. And the huge array of tunnel sections in the various installations and boss enemies (you have to travel inside some bosses) are so impressive you'll be swaying from side to side as you navigate them.

Of course, at this stage of development there is still some room for improvement. Explosions, as in *TFX*, could benefit from more colour and more ambitious animation: they're over far too quickly, providing an inadequate impression of the destruction you've wreaked. And the parts where your ship emerges from beneath the water are a little unconvincing, too. But these points aside, the PC version is looking extraordinarily good, with Alien Sex Fiend's seriously ambient music adding substantially to the game's atmosphere.

On the CD32 and A1200, things are a little less advanced. **Charlie Wallace** is behind the translation: 'The CD32 and A1200 are actually slower than a low-end PC because of the bottleneck imposed by the chip memory. But having a double-speed drive should improve the animation quality.' The 3D engines of both versions will use 8bit graphics. 'It's accessing a lot more chip memory because of the 256 colours and that slows the processor down slightly,' explains Charlie.

The Akiko (chunky graphics to planar graphics conversion) chip should make a difference with the CD32 version. 'It's quite possible it'll have a faster frame rate than the A1200 because the poly fill is faster when working with the Akiko chip.'

Inferno is currently scheduled for a mid-May release on the PC, with the CD32 and A1200 versions making an appearance sometime in the autumn.



'For me, it's far more important to get a fast, responsive frame rate than go overboard with graphics'

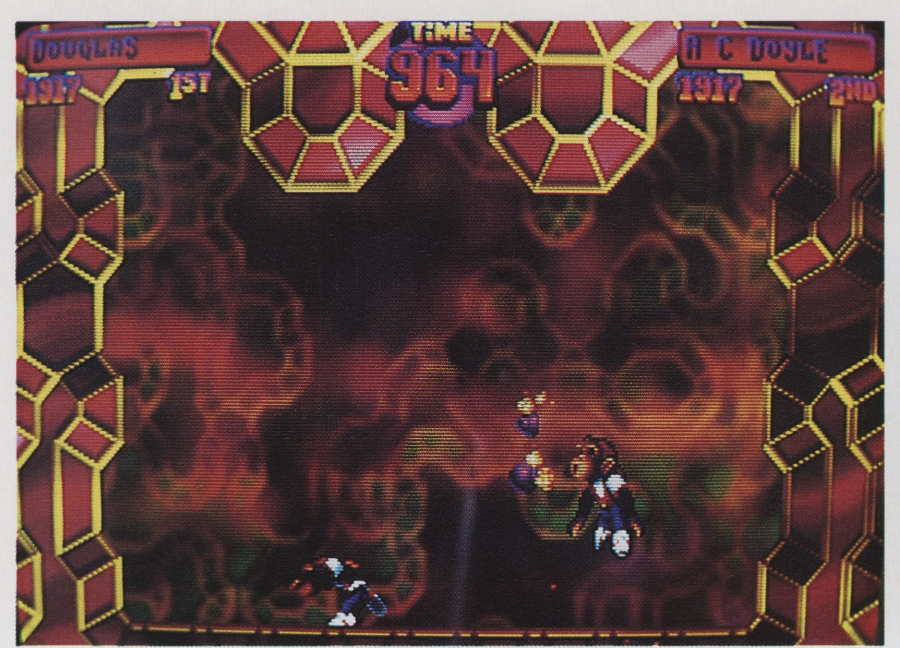
Russell Payne, programmer



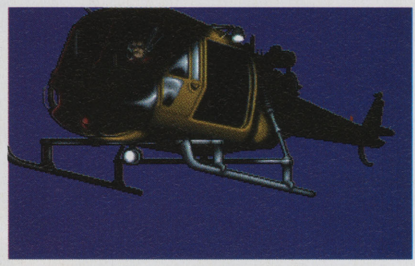
Credits

Software manager: Colin Bell
3D engine: Russell Payne
Lead game coder: Dave Dixon
Art: Shaun Hollywood
Art: Rob Ball
Art: Donna Chippendale
Game design: Shaun Hollywood
Game design: Paul Hollywood
Music: Alien Sex Fiend
Music: Barry Leitch









Clockwise: *Apeshit* (Jaguar), *Green Lantern* (SNES) and *Central Intelligence* (PC)

Ocean Software

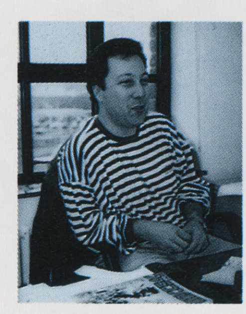
Ocean are one of the first thirdparty developers to jump on the Atari Jaguar bandwagon; but where is it taking them?

One of the most attractive buildings you'll find in Central Manchester is Eastgate, Ocean's stylishly understated headquarters dominating the newly gentrified Castlefield area. **Edge** dropped in on software development director **Gary Bracey** to check out the company's new-found commitment to Atari's Jaguar.

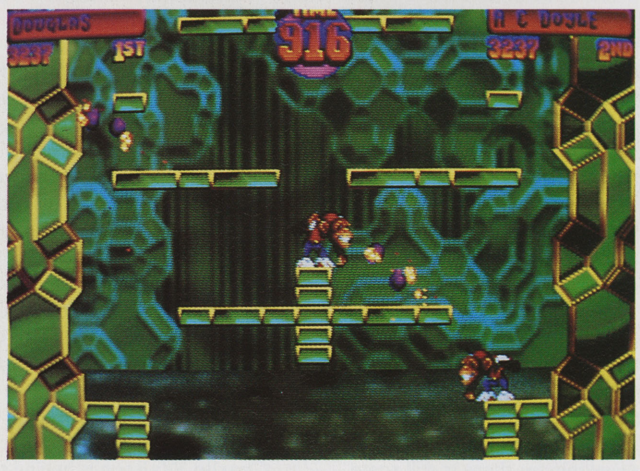
With the 16bit market slowly diminishing, Ocean are counting on Atari's new machine: 'We'd like Atari to succeed primarily because we're looking for a replacement format,' admits Gary. Ocean are currently juggling two projects: one cartridge game and one CD game.

The cartridge project, *Apeshit* (a working title, we hasten to add), was originally undertaken by Warren Lancashire, who shaped the excellent *Pugsley's Scavenger Hunt* on the SNES. His return to the company after a break means he will continue to be involved with the project.

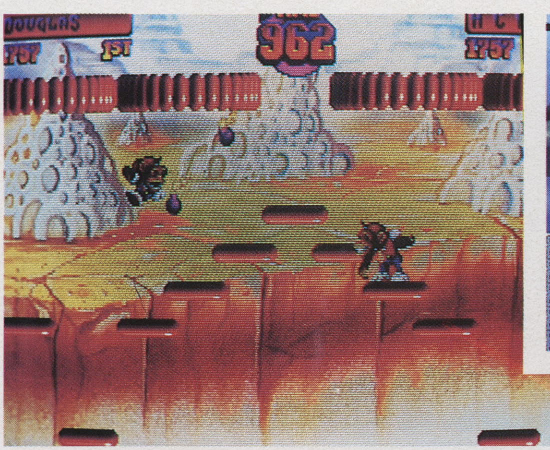
'A platform game with a difference' is hardly a description to inspire confidence, but if only for the wonderfully colourful graphics, *Apeshit* looks quite smart even at this early stage. While *Crescent Galaxy* might have given some indication of the Jaguar's sprite handling abilities, *Ape* could prove to be a benchmark parallax scroller for Atari's machine. Described by programmer **Bobby Earl** as 'a mixture of *Mario*, *Bomberman* and *Pang*,' *Ape* is essentially a simultaneous twoplayer cooperative



'We'd like Atari to succeed,' admits Ocean's Gary Bracey



Apeshit, sporting some of the nicest graphics yet seen on the Jag. The final name has not yet been decided – *Monkey Business*, perhaps?





More great graphics from *Apeshit* (left), and SG rendering for *Central Intelligence* (PC)



A Silicon Graphics-rendered *Lobo* – Ocean's first project for Atari's forthcoming Jaguar CD drive

platform game with traditional console-style play mechanics.

With much of the game design yet to be implemented, the most appealing aspect of *Ape* is the silky smooth 16bit-colour parallax scrolling. 'All that requires is the 68000 and the object processor,' reveals Bobby, ' but we'll be using the GPU and the blitter for creating some clever 3D effects in the backgrounds.' The backgrounds in question were drawn freehand by artist Ged Cafferley before being scanned directly onto the screen.

Ocean's other Jaguar title, *Lobo*, is based on the violent comic character of the same name and is an altogether more ambitious project, destined for the CD drive. 'The concept of the game is very, very new and at the moment we're simply experimenting with the game style and how it'll work on the Jaguar.'

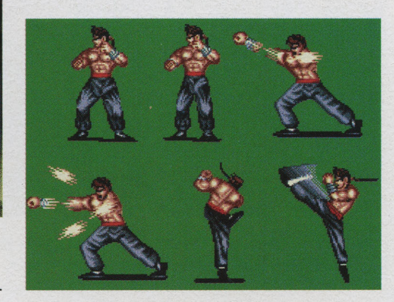
'We see the Jaguar as a creative challenge rather than a technical challenge'

Gary Bracey, Ocean Software

To fire the imaginations of the guys involved, a roomful of Silicon Graphics workstations is being used to mock up 3D rendered game environments. Some of the video sequences are expected to run at 25fps on the Jag's double-speed CD drive.

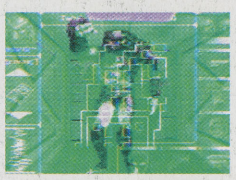
Gary sums up the company's new direction: 'We see new machines starting with the Jaguar as a creative challenge rather than a technical challenge. We're moving away from the traditional movie licence, and the philosophy now is content, quality and originality. A good programmer on the Amiga will usually be a good programmer on the Jaguar – it's that simple.'

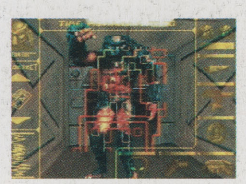
Ocean's predilection for platform games is confirmed with their latest Mega Drive and SNES project – *Green Lantern*, based on the US comic

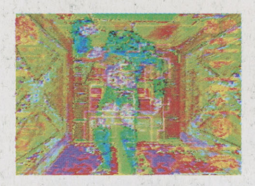


Aliens Vs Predator

Can *Aliens Vs Predator* compensate for the Jaguar's monstrous lack of software? **Edge** tracks it down







The Predator has three modes of vision: (from top) normal, night vision and crazy psychedelic, daddio

Format:	**Jaguar**
Publisher:	**Atari**
Developer:	**Rebellion**
Release date:	**April**
Size:	**1 CD**
Origin:	**UK**

Movie-licensed games have historically been a poor bunch. Rarely has a game brandishing a film logo managed to capture the excitement of its silver-screen counterpart. But, oddly, the film licence genre continues to be one of the most lucrative avenues for software publishers to take.

Oxford-based Jaguar developers Rebellion Software have joined the growing film-licence brigade. But their effort, *Aliens Vs Predator*, is a genuine attempt to overcome the stigma attached to games of this type – and, in the process, give Atari's 64bit machine a boost.

Instead of taking the usual platform/beat 'em up approach normally associated with film-licensed games, Rebellion have chosen to go for a firstperson action/adventure game. And in doing so, they have set a graphical standard by which other Jaguar releases will be judged. Speed-wise, the 3D corridor graphics in *Aliens Vs Predator* are no real improvement on Id Software's *Doom*, running on a DX2 PC. But the texture-mapped effects have a finer and more defined look about them. Everything is depth-cued, too: objects fade into and out of the screen smoothly and convincingly.

Jason Kingsley, Rebellion Software's creative director, reckons this is just a taster of what the Jaguar is capable of: 'Although we've got *Aliens Vs Predator* running in 16bit colour [65,000 colours onscreen], the Jaguar does have a true-colour mode which can display over 16 million colours. Trouble is, this eats up lots of processing speed.'

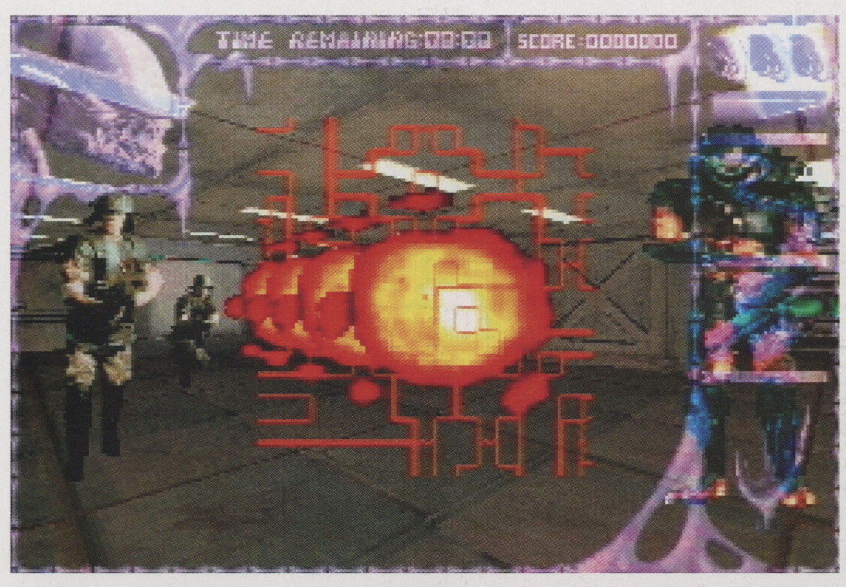
Jason adds that instead of drawing the

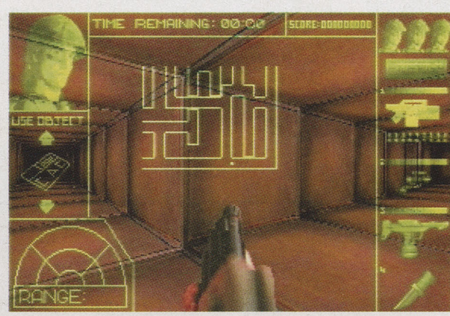


Rebellion have set a graphical standard by which other Jaguar releases will be judged



***AVP* comprises 12 levels, allowing you inside both the Predator ship (main) and the Alien vessel (inset). As you can see, neither race is big on interior design**








***AVP* characters can access level maps which, like a head-up display, hover in the middle of the screen (top right). If the display panel isn't needed it can be faded out (bottom)**

background graphics onscreen (a laborious and time consuming process), they elected to make physical models of the corridors and various parts of the ship's interior. These models were then photographed and digitised into the game proper.

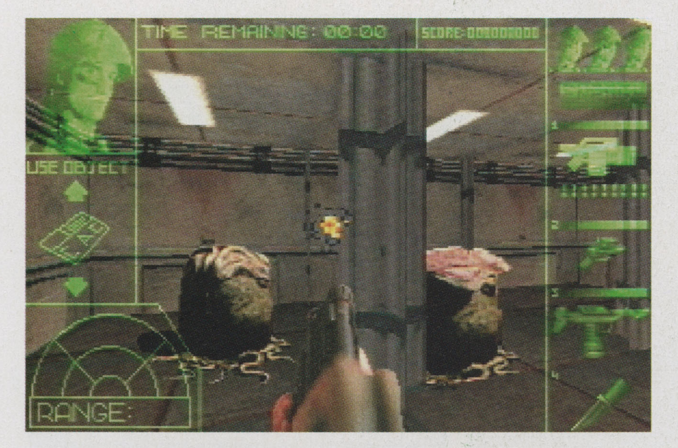
'It took seven months to set up our Advance Texture Manipulation programme,' Jason explains, 'but after it was set up, we could texture map all the bitmapped images with ease.'

Unlike *Doom, Aliens Vs Predator* is more than just an attractive 3D shoot 'em up. Rebellion have added another dimension to the play mechanics by giving the player a choice of three characters to control: a Colonial Marine, an Alien, or a Predator. Each character has a mission: for example, the Marine has to rescue survivors and set the base to self-destruct. And each character moves and responds in a different way.

Jason explains: 'It's something we've worked really hard on. We're trying to give each character their own personalities, their own inertia. So, if you play as the Predator, the screen will bounce a lot as you run through the corridors. He will take some time to get to his top speed, and slowing down won't be instant. But his armoury more than makes up for any of his physical deficiencies.'

Sound also plays a big part in creating the right atmosphere for this type of game. The visuals in *Aliens Vs Predator* may provide the requisite dark and sinister environment, but the sound has to add another dimension. The team hope to use samples from the movies in the game, but sadly, it looks like memory restrictions may get in the way: 'We're hoping to utilise the samples we've gathered, but we'll have to wait and see if we have enough room,' says Jason.

Let's hope they don't take too much time finding out – *Aliens Vs Predator* is due for April release. Check out Testscreen in a future issue of **Edge** for the full review.



This is the source of the Alien infestation. These eggs started life as a latex model, which was photographed and digitised into a bitmap graphic. Nothing a pulse rifle can't deal with...

Credits

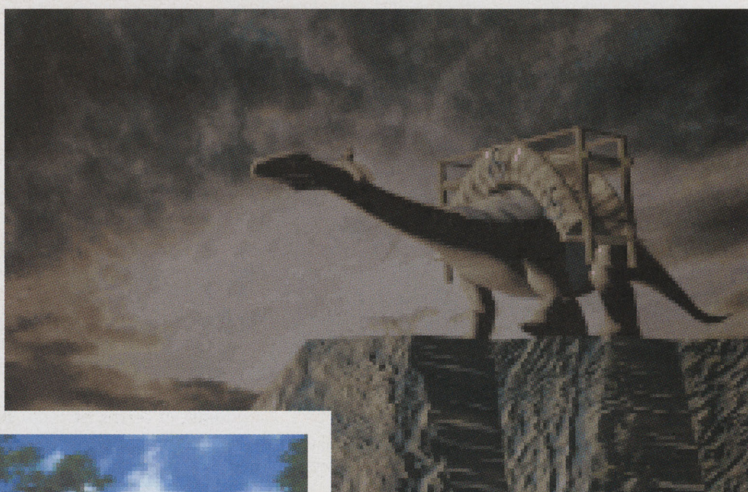
Creative Director: Jason Kingsley
Programmer: Mike Beaton
Programmer: Andrew Whittaker
Graphics: Tony Harrison-Banfield
Graphics: Stuart Wilson
Sound: Chris Kingsley




The characters in *Aliens Vs Predator* each have around 70 frames of animation







Dino-utopia: Cryo's extravaganza contains the best collection of rendered Brontosaurs, Stegosaurs and T Rexes this side of Jurassic Park. *3D Studio* delivers the goods again

The Lost Eden

Cryo's dino epic could be the game the CD market has been waiting for. **Edge** went to Paris to see it

CD-ROM and interactivity have often had an awkward relationship – at least in terms of gameplay. Certainly, as hopes for CD-ROM get more ambitious, interactivity is usually the first element to be starved of air; designers are trying so hard to make the most of the format that all too often it's gameplay that ends up getting the life squeezed out of it.

So it's reassuring to hear a group of game developers speak enthusiastically about the future of CD-ROM. And Paris-based software house Cryo Interactive have a strong enough line-up of CD-ROM titles to give their commitment credibility. 'We think CD-ROM has a huge potential,' says director **Jean-Martial Lefranc**, 'and currently we are heavily committed to rendered graphics and CD-ROM because it's an effective way of covering a wide number of formats. At this stage you've got to cover all the options.' Besides, the proof is currently in the sales: *Dune CD* has sold twice the number of copies it managed to shift on floppy.

The Lost Eden, first featured in **Edge** 4 under its previous name, *Saurus*, has a similar game structure to *Dune*, but is far more refined: a collection of breathtakingly beautiful graphics give it unprecedented visual appeal. With *Eden* set in a civilisation inhabited by humans and dinosaurs, Cryo are obviously pinning their hopes on Jurassic Park-inspired dinomania. 'The project was actually started well before the film came out,' recalls Jean-Martial, 'although we'd heard that it was coming and guessed that dinosaurs were going to be 'in'. Personally, I see no reason why they shouldn't always be a popular theme, as long as the scenario is original.'

Designers are trying so hard to make the most of CD-ROM that all too often gameplay gets the life squeezed out of it

Continued next page

Continued



Eloi the pterodactyl is your narrator and companion for the duration of the story



This wise old bird is Priam The Conqueror, Adam's father



Mutually beneficial arrangements are central to Adam's strategy

As luck would have it, the scenario behind the *The Lost Eden* is both original and engaging. Sure, the idea of humans co-existing with dinosaurs is as old as the hills, but as far as games go this is certainly different. In the words of Cryo director **Remi Herbulot**, 'We have tried to create a game with a very strong story, so players have a real experience playing it, and will have strong memories of it.'



The story goes something like this: in an alternative Eden, humans have befriended herbivore dinosaurs and live with them in huge citadels, built for protection from their mutual enemy, the T Rexes (as you might imagine, the friendly dinosaurs come in handy for lugging around pieces of rock).

'We have tried to create a game with a very strong story, so players have a real experience playing it'

Remi Herbulot, joint MD, Cryo

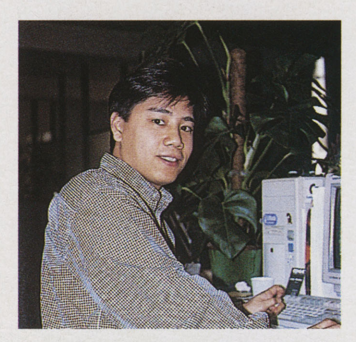
You play the part of a young man, Adam, whose grandfather turned against his own people, enslaved the dinosaurs and declared war on the T Rexes. The citadels were destroyed and, more importantly, the secret of their construction – invented by your great-grandfather – was also lost. Basically, the purpose of the game is to set out and discover the secrets of the builders so that the citadels can be rebuilt.

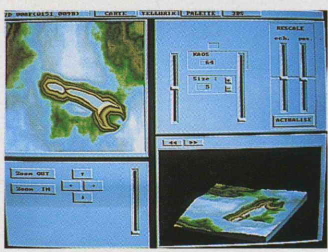
There are four continents to travel across and various tribes of people to meet. Ultimate success in your quest depends on persuading both humans and dinosaurs to help you – one scene, for example, involves travelling into a forest and finding some eggs that can be offered as a gift to the dinosaurs. (And it's delivered in the most beautiful way possible.)

Like *Dune CD*, the game uses large characters onscreen, with overlaid text and digitised speech, comprising over 100 different voices. In fact, *Eden* contains the backbone of the *Dune* game engine, although many elements have been vastly enhanced. 'We tried to simplify the strategy element of *Dune*, which was a bit boring towards the end,' explains Remi. 'We've definitely put more emphasis on the story this time.' This is where Eloi, a pterodactyl, comes in – he acts as the narrator, guiding the player through the game, and explaining and describing events as they unfold.

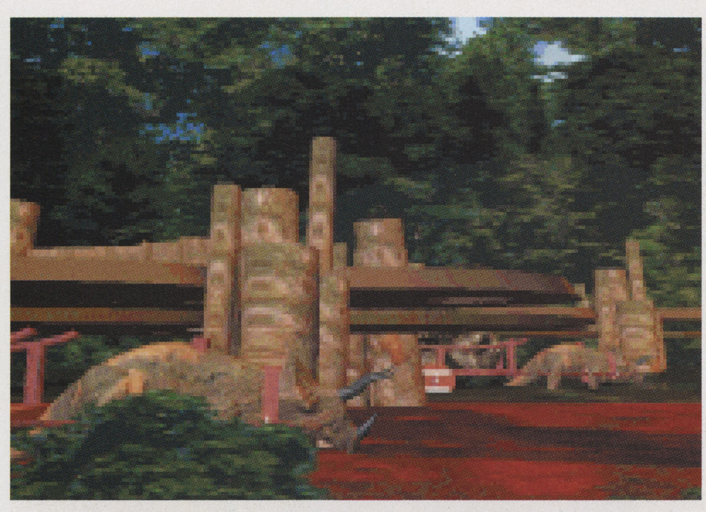
As in Virgin's *The 7th Guest* and countless other CD games, an onscreen icon shows the possible directions you can take. Select one and a pre-rendered flick file plays while you're transported to the next location. Of course, this is nothing new, but the sheer range and quality of the images in *The Lost Eden* are stunning. There's a genuine elegance to the proceedings, a real ethereal beauty. And the huge range of animations means that this is no ten-minute wonder, either.

Sohor Ty is one of the Cryo graphic artists responsible for the project. He explains: 'We've had





Sohor Ty, graphic artist on ***The Lost Eden*** (top). Backdrop landscapes were designed in an innovative custom modelling utility (above)



Once the herbivore dinosaurs are on your side, they can be used to pull rocks and trolleys; with their aid, you can build citadels to keep the T Rexes out

two people modelling shapes for dinosaurs and I've been mainly involved in rendering the animations and backgrounds, and constructing some of the citadels. We use a mixture of *3D Studio* and a realtime landscape designer.' Rather than creating a mountain range in *3D Studio*, the team could adjust contours realtime by raising and lowering the landscape, thanks to an impressive utility knocked up by *Captain Blood* co-designer Didier Bouchon.

On the PC all the game graphics use 256 colours, while most of the animations take up over ten megabytes in uncompressed form. Despite the single-speed drive bottleneck on many cheaper CD-ROM drives, this is all handled at 15 frames per second. And on CD32, with its 300K/sec drive, things should be even faster.

But what do Cryo make of the traditional drawback of CD-ROM, namely linearity? 'Linear gameplay is currently a problem of technology,' offers Jean Martial, 'but step by step we're designing to cope with the shortfalls of CD-ROM and are drifting away from the linearity. However, I still don't think CD-ROM will be big with action games fans just yet – not until realtime rendering is possible.' Needless to say, Cryo are looking forward to the hardware that will make it a reality, although they are keen to emphasise their impartiality: 'I don't really care which machine succeeds as long as we can create decent games for it,' shrugs Jean-Martial.



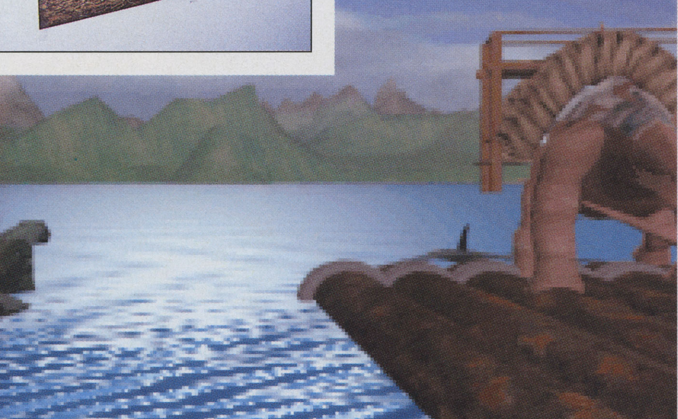
'I don't think CD-ROM will be big with action fans yet – not until realtime rendering is possible'

Jean-Martial Lefranc, joint MD, Cryo

'At the moment we are learning how to manage a large team on a game and how to get a full storyboard before we start, and how to spread the work between the animations and backgrounds and different types of graphical techniques. Obviously, technology is quickly heading towards realtime, but we want to have mastered lots of new production techniques before that actually happens.'

The Lost Eden will be released first on PC CD-ROM in May, with a potentially gorgeous MPEG CD-i version and a CD32 version following later in the year.

Cryo not only created games like *KGB, Conspiracy*, and the upcoming *Mega Race*, but members of the team were also behind some older French classics. Philippe Ulrich designed *Captain Blood* with Didier Bouchon, while Remi Herbulot created *Get Dexter, Purple Saturn Day* and *Pinball Wizard.*



Getting 50 tons of dino across a river is easy when you know how (main). The designers at Cryo used all manner of dinosaur images for inspiration (inset)

Credits

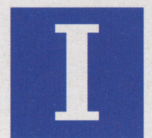
Manager: Remi Herbulot
Programmer: Patrick Dublanchet
Programmer: George Torres
Artist: Jean-Jacques Chaubin
Dinosaur modelling: Philippe Jedar
Dinosaur modelling: Yvon Trevin
Graphics: Sohor Ty
Graphics: Isabel Grospiron
Music: Stephen Picq

Top Hunter

After a long period of beat 'em up obsession, have SNK finally started to recognise the demands of the home Neo-Geo owner for a bit more variety?

With only four worlds to select, it ain't huge

Format:	Neo-Geo
Publisher:	SNK
Developer:	In-house
Release date:	April (Japan)
Size:	100+ Mbit
Origin:	Japan



In 1985 Capcom released a splendid coin-op called *Top Secret* which featured two cute characters blessed with extending bionic arms. Hence the name *Bionic Commandos*, as the game was known over here.

Top Hunter looks extraordinarily similar at first sight. Both of its main characters are cute, and both possess extending arms. But try and find the Capcom classic's ingenious gameplay and you discover that this is where the games wander off in opposite directions. There are four long-ish horizontally scrolling stages to get through, each one complete with the usual array of dazzling parallax backdrops and nicely designed sprites, but instead of adapting Capcom's skilful gameplay, the action here is more akin to a side-scrolling beat 'em up – albeit a well designed one.

What's the expression? Plus ça change...



Those parallax backgrounds are just as colourful as in most Neo-Geo games

There are four long-ish stages, each with the usual array of dazzling parallax backdrops and nicely designed sprites



Top Hunter's main feature is the much under-used extending arm. Grab enemies with it (above) or simply use it as a weapon (inset)



Of course, there are more traditional ways of disposing of an end-of-level boss. Like *Fatal Fury*, the action takes place across two planes

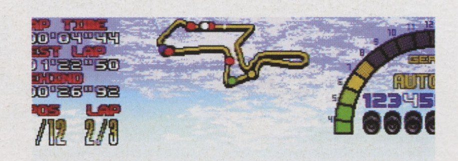
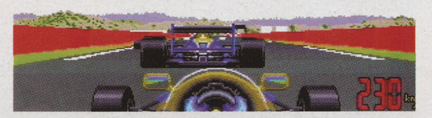

BRAVO
TIMEWARP
TELEVISION

CD32

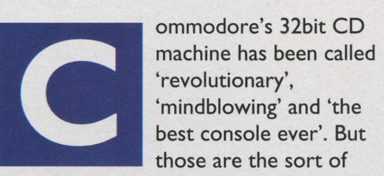


Too **little**, too **soon**?

The CD32 was the first 32bit CD games system. But now its rivals have caught up. **Edge** explores the genesis of the machine and asks: Can it really compete?

***Nigel Mansell* makes it to the CD32, but it hasn't gained anything in the transition**



Commodore's 32bit CD machine has been called 'revolutionary', 'mindblowing' and 'the best console ever'. But those are the sort of epithets invariably bestowed on new games systems. Since the appearance of the CD32, a plethora of new machines has been unveiled, all of which have attracted similarly lavish praise. What does the CD32 have to offer that they don't? And more importantly, what effect will it actually have on the games market? The time has come for the CD32 to be re-appraised.

The CD32 was officially launched in July 1993 at the Science Museum, Kensington before an all star audience of developers, journalists (including representatives of national newspapers) and Commodore top brass. Continually emphasising the fact that the CD32 was the *first* 32bit console, Commodore UK boss **David Pleasance** asserted that this was 'the biggest thing that Commodore has ever done'.

The logic of a games console based on compact discs had been apparent to many people in the industry for some time. In the

Continued next page

Hardware: CD^{32}



early days of digital information storage there had been too much diversity, with minidiscs, DATs, DCCs and so on all trying to get in on the act. But as more and more types of data started to be stored on CD (music, video, photographs, applications software, etc), media manufacturers grasped the opportunity for a universal storage medium and placed their weight firmly behind those shiny, cheap and resilient discs. Now that it had been decided (and the format chosen was immaterial) that all digital information was going to be stored on CD, and with the production costs of CDs plummeting, it seemed to make sense that the games industry should follow suit.

Commodore had actually realised that CD was the format of the future at the beginning of the decade when they produced their first CD console, the CDTV. Unfortunately, at that time the technology required was still expensive. Nobody was likely to pay £900 for a console – and corners had been cut to get the price down that far. Also, the Amiga technology on which CDTV was based was already out of date. Commodore weren't able to dig their way out by marketing the machine as a 'multimedia' tool, and CDTV faded into obscurity. Commodore weren't the only ones to get it wrong, however: Philips followed soon after with their own CD games machine, the CD-i, which suffered similar difficulties.

Dramatic advances in Amiga technology eventually led to the development of the A1200, which boasted increased speed, 32bit architecture and redesigned graphics chips. More importantly, advances in Commodore's engineering practice, spearheaded by their new engineering chief, Lew Eggebrecht, made the A1200 cheaper to produce. At last the time had come: A1200 technology could be married to cheap, high-performance CD capability, and the CD^{32} was born.

'It's one of the better machines with a CD drive you can get. The fact that you've got a double-speed CD player puts it ahead of the game, for a start'

Mike Simpson, Development Manager, Psygnosis

The hard part – designing a CD-based games machine and producing it at an attractively low price – was now over. The toughest test for Commodore, though, was still to come: would people buy it?

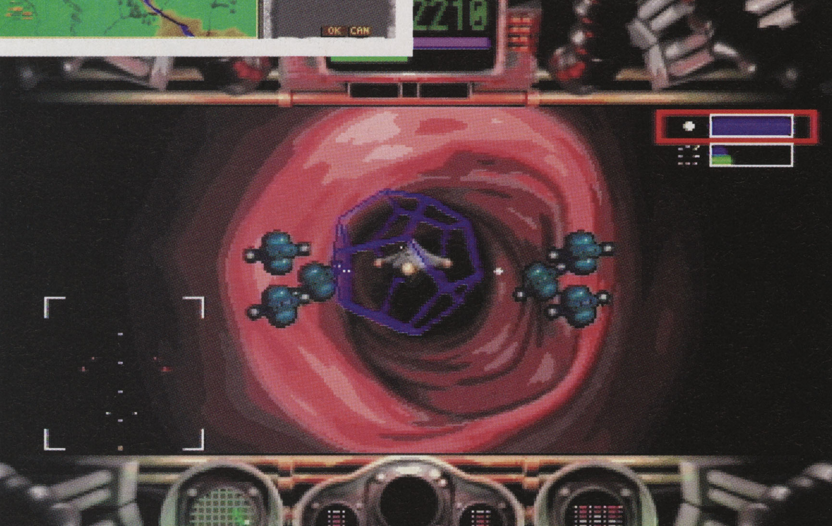
In the end, people are only going to buy a console if there is software available for it. Similarly, software developers are only going to produce software if it will sell in large enough numbers to make it worthwhile. With a CD platform, where people expect more than just an average game, the development costs are much higher and the risks consequently greater.

And the CD^{32} presents a couple of serious problems for developers. The major drawback is its lack of any facility for saving games. Cartridge-based consoles can get around the lack of disk drives by having battery-backed static memory in the cartridge itself. The standard CD is a read-only medium, however, and although the CD^{32} has plenty of RAM onboard, RAM is volatile (it loses data when the machine is switched off). A PCMCIA slot would have allowed the connection of static RAM cards, but these are expensive and, including the port, would have added to the cost of the system. Given the vast range of games that software companies will want to develop, having no save option is a drawback. Adventure and roleplaying games will be impractical to develop on a machine with a password feature as the only form of game save.

The other disadvantage is that the CD^{32}, like the Amiga, uses bitplane graphics. This simplifies memory management and screen mode changes – very useful when working on a machine with so many different display resolutions. It also makes for very easy parallax scrolling effects, as whole chunks of the screen image can be moved simply by offsetting the bitplanes involved. This is the secret behind many of the great scrolling games of Amiga history, such as *Xenon, XR35* and *Turrican II.*

Unfortunately, with the gradual swing towards the PC as a development platform, many games companies found themselves having a great deal of trouble converting to the Amiga. The major reason is that, instead of bitplane graphics, the PC uses the byte-per-pixel, or chunky graphics,





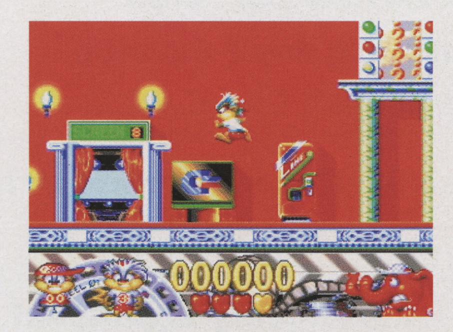
Microcosm **(main) was intended for the CDTV, but Psygnosis had a rethink when Commodore's baby failed to sell. *Castles II* (inset) was just too big to realistically run from floppy**

This is not a machine that is going to win any design awards. The colour is dreary, the plastic is nasty and it's a horrible shape. In its favour, though, it is incredibly cheap – something which can't be said of some of its rivals, such as CD-i or 3DO (when it eventually arrives in the UK)

system, by which the colour values for pixels are expressed continuously one after another. This makes scrolling rather difficult, but individual pixel colour changes are a lot easier, because it can be done with one write to memory rather than, for example, the four it would take on a 16-colour Amiga screen.

Games such as *X-Wing* on the PC rely on a large number of software-generated polygons. Setting up graphics like these on an Amiga screen is not only a tricky coding job, but it also results in a much slower finished product. A software developer looking at a 90% rewrite of a game just so it could be released on an unproven platform would be tempted not to bother.

But Commodore went out of their way to make it as easy as possible for the software industry to develop games for the CD32. The evidence for this is in their inclusion of the VLSI (Very Large Scale Integration) chip, also known as the 'Akiko' chip, in the machine. Dominating the right-hand side of the circuit board, VLSI is a custom graphics chip for converting byte-per-pixel graphics into bitplane graphics. It strips out chunky pixels into bitplanes for direct display on an Amiga-style screen. Its presence on the CD32 motherboard is intended as a powerful inducement to software companies to develop for the format.



***Oscar* is just one of the terrible games included in the current CD32 bundle**

Despite Commodore's

intentions, however, the reaction from developers has been mixed. (Commodore failed to deliver the promised 18 titles at launch, and for the first few weeks after the machine's release there was in fact no software *whatsoever* available for it!) Among those interested enough to dip their toes in the water were *Millennium*, with their strategy adventure *Diggers* (which, together with the platformer *Oscar*, was one of the first games to be bundled with the machine). This will soon be followed by a conversion of *James Pond*.

Also fairly enthusiastic are Virgin. Although they released a game for CDTV, *North Polar Expedition*, and got their fingers burned, that hasn't put them off converting the rather excellent *Dune* from the PC for CD32. Virgin have an advantage in that they will be able to look to their extensive back catalogue of PC CD-ROM titles for conversion to the CD32.

Continued next page

Hardware: CD^{32}



The keyboard connector on the side of the CD^{32} could be a life saver, not only because roleplaying and adventure games can take advantage of it, but because it allows the machine to act just like its Amiga cousins. Without it, it would be limited to being just a games machine

Continued



Psygnosis have also done work for the machine. *Microcosm* was originally intended for the CDTV, but was delayed so that it could be re-written in part for the CD^{32}. They had initially planned to wait until its success could be gauged before following it up, but are now committed to several more CD^{32} titles, including *Second Samurai* and *Hired Guns*, and are contemplated developing *Scavenger 4*. The company's London Development Manager, **Mike Simpson**, is one of CD^{32}'s proponents: 'It's very nice. As value for money it's very good, one of the better machines with a CD drive you can get at the moment. The fact that you've got a double-speed CD player puts it ahead of the game, for a start. Anything you can do on the Amiga 1200 you can do on CD^{32} but with massive amounts of graphics and sound. It's great.'

Another convert is Ocean. Although at launch the company had not committed themselves to producing any CD^{32} titles, they recently announced that *TFX* and *Inferno* will be released in April this year. Ocean's Software Development Manager, **Gary Bracey**, believes the CD^{32}'s similarities with the Amiga will be a significant advantage: 'The hardware's great: it's lovely to have something that familiar to work with. We've all grown up with the Amiga and we're terribly familiar with its quirks, so from that point of view it's like a comfortable pair of shoes.' But he admits: 'We are not doing any CD^{32}-specific developments yet. We don't develop specifically for a format until there is a very significant userbase. But obviously we constantly keep our options open and as soon as the CD^{32} has a large enough userbase to qualify, then we will develop specifically on that format.' As far as the CD^{32} is concerned, Ocean are evidently adopting a policy of 'wait and see'.

'We are not doing any CD^{32}-specific developments. We don't develop specifically for a format until there is a very significant user base'

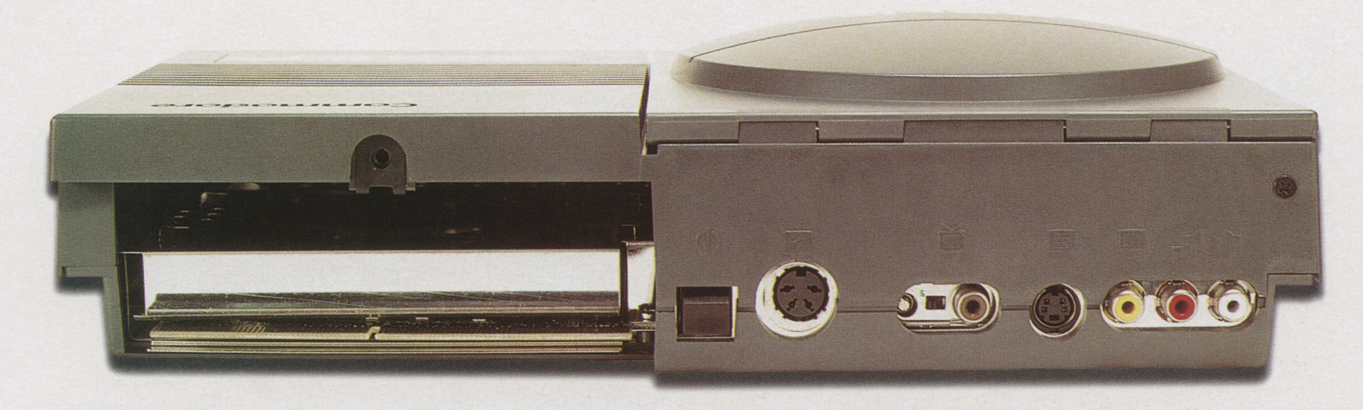
Gary Bracey, Software Development Officer, Ocean

A major problem for the CD^{32} is that many of the games already released for it have simply been unchanged reissues of successful old Amiga games: *Sensible Soccer*, *Pinball Fantasies* and so on. A few are re-releases that have been updated to take advantage of the increased storage space and capabilities of the CD^{32}. MicroProse's *Pirates*, for example, is very much the same game that was released for the Amiga three years ago; the graphics have been enhanced to take advantage of the better resolution, and some stunning fullscreen rendered sequences have been added to give the game a better feel, if not exactly extended playability.

Obviously, this rehashing of old Amiga titles is not likely to persuade potential buyers that CD^{32} is the console of the future; the success of the machine depends significantly on the extent to which traditional Amiga developers can be persuaded to produce original titles for it. **Shaun Griffiths** of Instinct Design agrees: 'It would be good to see a lot of Amiga expertise being put to good use on the CD^{32}. At the end of the day it's down to the software people, people like The Bitmap Brothers and Sensible. If they can come up with good, strong titles specifically



***Sensible Soccer* was originally going to sell at a sensible price, until CBM imposed a levy**



This impressive array of connectors at the back of the CD32 includes composite, RF and S-Video output, stereo audio phono sockets and an expansion port which allows the machine to connect to add-ons such as the FMV module. No RGB output for SCART connection, though

for the CD32, then I think it stands a pretty good chance.'

But Shaun Griffiths, like other developers, accepts that in terms of specs the CD32 is a runner-up: 'When you look at things like the Sega Saturn and the Sony PS-X, the hardware qualities of those machines far surpass the CD32. The weaknesses are that it hasn't got polygon engine hardware and stuff like that. I would have liked to see a little more in the way of specialised hardware chips in there.'

Veteran games developers Bullfrog are a little scathing too: 'It doesn't have enough RAM and it's still a bit too slow,' says chief **Peter Molyneux**. '[But] for us the really good thing is this 'planar' chip. We can do some good things with that.' (*Syndicate* is a likely candidate for conversion.)

Games developers DID (responsible for *TFX* and *Inferno* – see Prescreen, page 32) are also less than enthusiastic about the CD32. 'It's okay for sprite games,' reckons Amiga coder **Charlie Wallace**, 'but for polygons it's pretty slow when compared to, say, a 33MHz 486 PC.'





The unimpressive *Diggers* (top) was included in the initial CD32 bundle; it was replaced by the even worse *Dangerous Streets* (above)



FMV may have backing from Philips and Paramount, but will people choose CDs over videotapes?

But the CD32 is another of those machines with aspirations to be much more than just a games platform. The first add-on for the machine was launched in February this year: an MPEG decoder cart which subscribes to both the white book and green book standards for full-motion video, allowing people, if they so wish, to junk the VCR and watch movies (albeit short ones) on their CD32. But of course, CD32 is not the only machine that will be able to use FMV discs. Philips' CD-i machine can also play them in conjunction with their own MPEG decoder, as can the 3DO, and there will undoubtedly be many more platforms offering this capability in the future. Technically, the CD32 offers no advantages over other systems in this respect, save that the Commodore MPEG unit, at £200, will probably make CD32 FMV marginally cheaper than that of its nearest rival, Philips' CD-i.

Quite apart from the prospect of using the CD32 to watch movies, FMV offers the possibility of games with live video backdrops or adventures with real video sequences instead of just animated

Continued next page

Hardware: CD^{32}

Continued



sprites. (It is not something that the film companies have been slow to pick up on, either: during the filming of Star Trek: The Next Generation, extra scenes were shot during the series for a possible full-motion video adventure.) Initially, such titles will probably be nothing more involving than a cheap multiple-choice style adventure, but with clever film editing – and once programmers learn how to use MPEG playback well – they could develop into the most realistic games experience ever. But again, other formats will also be offering FMV games.

Another add-on for the expansion bus of the CD^{32} will be released here soon. Designed by well-known Amiga hardware manufacturers MicroBotics, it is a board that provides the CD^{32} with the standard Amiga ports found at the back of an A1200. Users will then be able to connect printers, floppy drives and all the usual boxes to the back of the CD^{32}. This gives it a certain amount of versatility that sets it apart from dedicated games consoles. Shaun Griffiths is certainly in favour of this idea: 'Commodore have a big advantage over Sega and Nintendo because the CD^{32} can be used as a home computer whereas a Mega Drive or SNES can't. I don't think Commodore can go head to head with the likes of Sega and Nintendo. They should concentrate on it being a home computer or at least a games console that can be converted into a home computer.'

> **'Commodore has a big advantage over Sega and Nintendo because the CD^{32} can be used as a home computer, whereas a Mega Drive or SNES can't'**
>
> **Shaun Griffiths**, Instinct Design

This seems rather pointless at first – if you wanted a 'proper' computer, you would have bought an Amiga A1200. But the crucial thing to remember is that, rather ludicrously, there is no CD interface for the A1200. The CD^{32} could therefore be regarded as the logical next step for loyal Amiga owners who want to upgrade to CD capability. Shaun Griffiths reckons that 'as a continuation of the Amiga range the CD^{32} is pretty impressive.'

CBM's first stab at a console-style controller could have been worse – it only hurts a little bit

According to

initial sales figures, the CD^{32} appears to be doing moderately well. By January this year, estimated total sales were in the region of 75,000 – less than Commodore's own sales targets, admittedly, but more than many industry watchers had expected. The retail industry seems to have high hopes for the machine, and Commodore have established a strong distribution network, with big chains like John Menzies, HMV, Comet and Rumbelow's all stocking the product. Core Design's **Richard Barclay** confirms the positive attitude among retailers: 'There seems to be an awful lot of confidence in Commodore's ability to sell a large quantity of units of CD^{32}.'

But whether this situation will persist when the competition starts to make its presence felt remains to be seen. Is CD^{32}, the first machine off the mark in the CD race, destined to be put out of the running by faster and more powerful machines? Certainly, as a dedicated games console, it has little hope of competing with the superior hardware of 3DO, Saturn and PS-X. However, if it manages to establish itself within the Amiga family as a complete system, equally at home with games as with other applications its success looks assured, at least in the existing Amiga marketplace. In fact, it could well become the Amstrad of the CD games market, providing cheap and cheerful (if not overly sophisticated) hardware that everyone can afford. But for that to happen, of course, it has to acquire some original software; after six months on the market, it's certainly taking its time about it.

The CD^{32} was designed as the ultimate console, but will the hardware already be out of date by the time anyone actually gets around to developing any quality software for it?

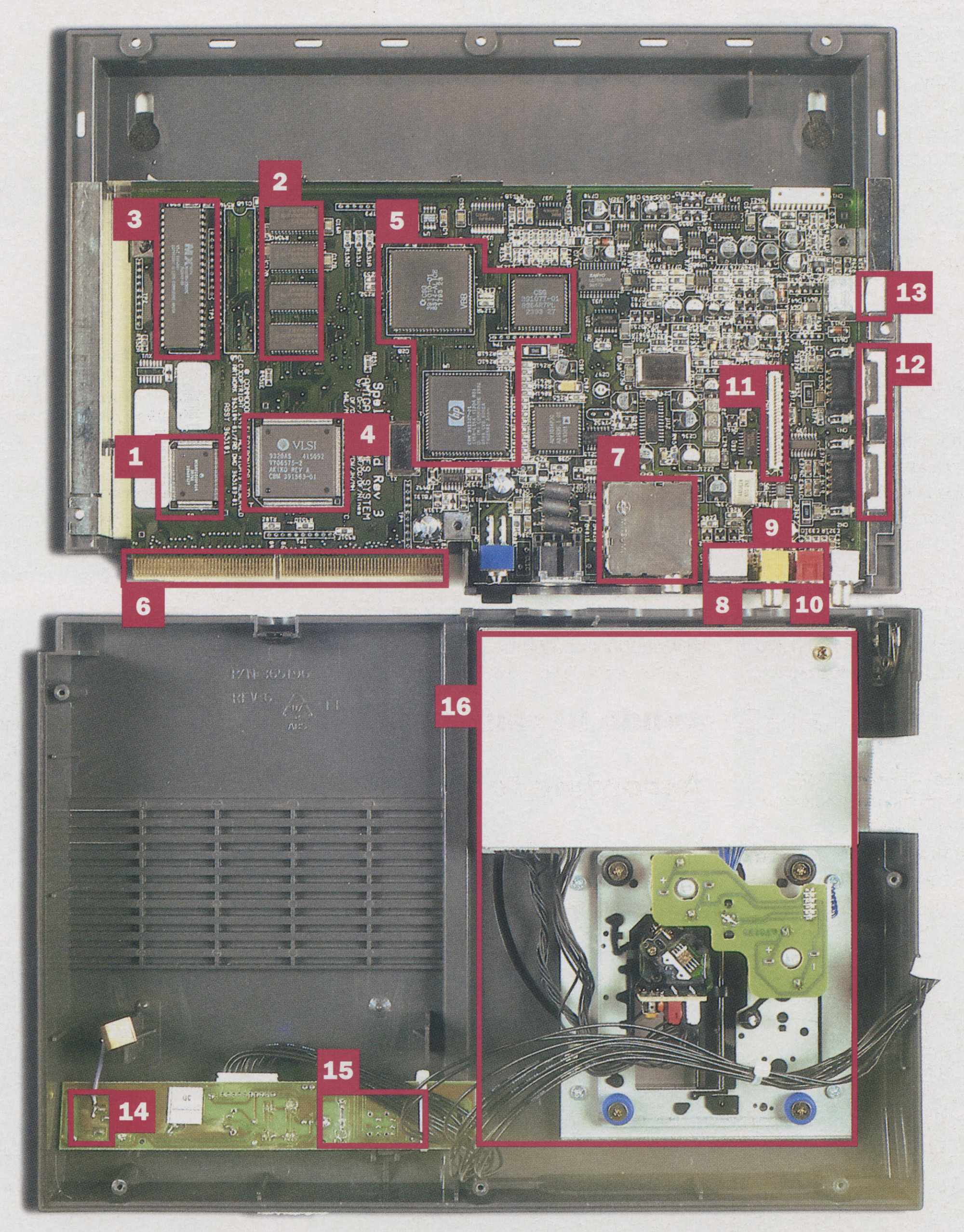
Revolutionary?

Mindblowing? The best console ever? For die-hard Amiga fans the CD^{32} is probably all those things, but others are likely to be rather less impressed. Ultimately, as Richard Barclay points out, 'It's only an Amiga A1200 with a disc drive, isn't it?' E

CD^{32} tech specs

Manufacturer:	Commodore
CPU:	32bit 68EC020 @ 14MHz
Memory:	2Mb chip RAM
Colours:	16.7 million, up to 262,000 onscreen
Screen resolution:	320x256 – 1,280x512
Graphics hardware:	AGA chipset
CD data transfer:	150-300K/second
Sound:	4-channel 8bit
FMV:	MPEG1 option

Inside the CD32



1 68EC020. The CD32's CPU is the same as that of the A1200. The '020, clocked at 14MHz, is around four times the speed of a 68000-based machine such as the Amiga 500 or the Mega Drive. **2** RAM. 2Mb of 32bit RAM. This RAM is directly accessible by the CPU and the custom graphics and sound chips, which enables the console to complete several tasks simultaneously and independently of the CPU. **3** ROM. Kickstart 3.1 is the same ROM found in the A1200. Theoretically, the CD32 could function in exactly the same way as the Amiga, down to running *Workbench* and any applications software compatible with the A1200. **4** Akiko custom chip. As well as overseeing access to the CD data, this chip can also convert byte-per-pixel graphics into the planar form used by the Amiga. **5** AGA chipset. These three chips are identical to the AGA custom chips found in the A1200. They are effectively independent processors which can handle their tasks (such as displaying graphics or playing sound) without reference to the CPU. Evolved from the original PAD chips found in the A500, they can operate around five times faster, thanks to a new 32bit DMA bus. **6** Bus interface. A fully functional bus interface, such as that found on the underside of the A1200. This interface allows the connection of other devices to the CD32, such as the FMV cartridge and, shortly, an interface allowing the connection of standard Amiga peripherals. **7** RF Modulator. Unfortunately, not a great improvement on earlier models; this is the same RF modulator found in any number of consoles. **8** S-VHS socket. The CD32 is unique amongst Amigas as it directly supports the S-VHS standard – a video connection which gives superior-quality images. Although most domestic video and TV equipment in the UK does not yet support S-VHS, it is becoming more common. **9** Composite video socket. A more common video standard than S-VHS; most modern VCRs and TVs will accept a composite input, giving greater picture clarity than RF. **10** Stereo audio out. Two standard phono sockets carry sound generated by the CD32 or direct audio output from a CD. **11** CD connector. Control and data lines run from this socket via a flexible cable to the CD mechanism. **12** Game ports. These consist of two standard nine-pin D-type connectors, which accept joypads, joysticks or a mouse. **13** Auxiliary serial port. A subminiature DIN connector allows a standard A4000 keyboard to be connected to the CD32. **14** Headphone socket. **15** Reset switch. **16** CD mechanism. A double-speed drive which can withstand the rigours of constant use. The new design eliminates the necessity for a caddy. **17** (not shown) Control pad. The new design of controller is far superior to the old CDTV controller, which was way too small. This improved model has seven buttons and a four-way direction pad.

Continued next page

Software: CD32



Edge's CD32 rollcall: more of a sad collection of ports than an assault on the senses. 1 *Wing Commander*: a thoroughly overrated game on every format. 2 *Disposable Hero*: technically impressive, overly tough, and virtually identical on the A500. 3 *Overkill*: Vision's slick A1200 *Defender* clone. 4 Ocean's charity game *Sleepwalker*, yet another port. 5 The new CD32 Spectacular Voyager pack includes *Microcosm*, *The Chaos Engine*, *Voyage 2* and *Dangerous Streets*. 6 *Lunar C*, a token – and completely awful – addition to the *Overkill* CD. 7 Ice's shoot 'em up *Deep Core*. 8 *Alfred Chicken* looks no different from the A1200 version, and, well, let's face facts, there wasn't that much difference between that and the A500 version. 9 And of course, no Amiga can roll off the production line without a pinball game by 21st Century. *Pinball Fantasies* is arguably the best of an exceedingly dodgy bunch

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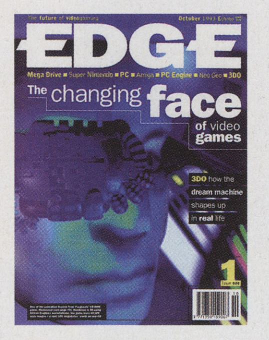
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Image created by Marcus Morgan



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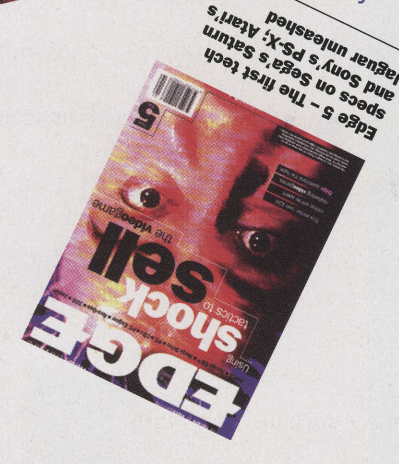
Edge 1 – 3DO: the real deal; Amiga CD32 launch; plus games in Dolby Surround sound

Edge 2 – Atari's Jaguar console; the truth about CD-ROM; interactive TVs; sex and violence



Edge 3 – First 3DO review; virtual reality explained; plus the Supergun home coin-op system

Edge 4 – First Jaguar review; Bullfrog and Cryo exposed; NEC's classic PC Engine



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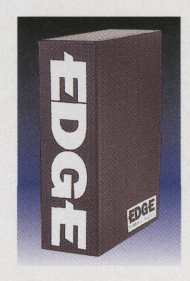
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The apex of Namco's coin-op technology: *Ridge Racer* (top) and *Galaxian³* (above). The developers (centre) and their R&D headquarters

Leader of the Pac

Namco are among the true pioneers of the coin-op business. **Edge** went to Japan to meet the driving force behind *Ridge Racer*

Ever since the first *Galaxian* and *Pac-Man* machines hit arcades almost 14 years ago, Namco have gained a reputation as consistent coin-op innovators. Founded in 1955 as the Nakamura Manufacturing Company (after its boss, Masaya Nakamura, a man who went on to become one of the most powerful figures in the Japanese videogames industry) the company has developed from small beginnings, manufacturing kiddies' rides, to become one of the powerhouses of the international arcade business.

So it was a rare privilege when these videogame legends played host to **Edge** in Japan. Namco have five main buildings in the greater Tokyo area, plus a chain of 22 offices throughout the country. **Edge** was the guest of their research and development department for consumer and coin-op games, which is based near Eda in the Tokyo suburb of Mirai Kenkyusho and contains around 200 people working on coin-op projects and console software.

Of course, one of the principal topics of conversation at Namco is the stupendous *Ridge Racer*. For anyone who hasn't yet seen the game, *Ridge Racer* is the pinnacle of the 3D driving game genre, delivering the best polygon graphics in the business. According to **Koichi Tashiro**, general manager of the computer graphics development department, it took a team of 40 programmers, designers, and musicians a year to develop the game. 'Of course, the hardware – System 22 – took much longer than that,' explains Tashiro, 'but it wasn't developed from scratch – we built on the techniques used to create our previous polygoniser, System 21 [as used in *Winning Run* and *Starblade*, amongst others] and also →





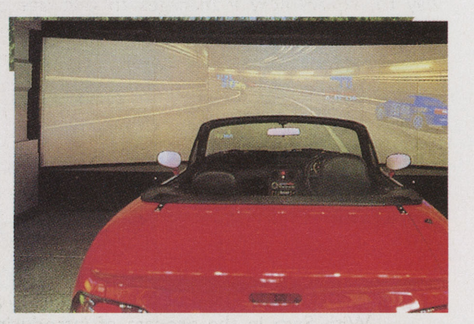
Koichi Tashiro (left), Noby Kasahara (centre) and Youichi Haraguchi talked to Edge about *Ridge Racer*, PS-X and more

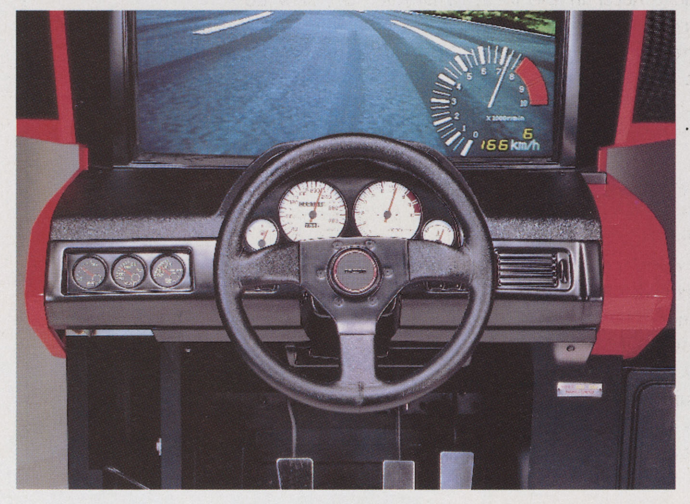
Namco's new baby, *Ridge Racer* (below). Its polygon technology was first seen in *Winning Run* and *Driver's Eyes* (bottom left and right)





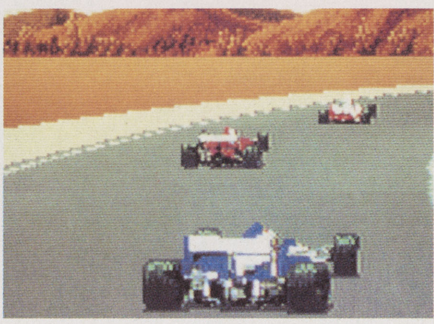


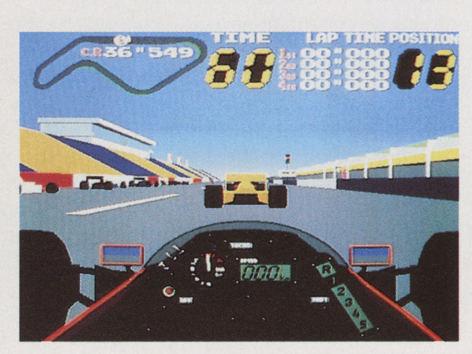












One of the most influential racing games of our time, *Pole Position*. In 1982, this was a significant step forward in 3D coin-op graphics

Five years later came the hugely successful *Final Lap*, followed by three more versions. Link-up is the secret to all the best racers

In 1990 *Winning Run* delivered the fastest, smoothest polygons this side of *Virtua Racing*. And the hydraulic cabinet was a bit special too

← employed techniques used to develop hardware that hasn't actually seen the light of day yet.'

As revealed in **Edge** 6, *Ridge Racer* is based on a 32bit CG (computer graphics) board incorporating Namco's custom TR³ polygon generator – a realtime texture-mapping, visual rendering system. Similar to Sega's new Model 2 CG board, System 22 has super high-speed calculation and drawing functions, but also supports full texture-mapping, Gouraud shading and depth-cueing for every polygon onscreen. It's mightily impressive stuff and, as Tashiro explains, represents a significant technological advance over other coin-op hardware: 'We developed the System 21 Polygonizer in 1989 for games like *Winning Run* and *Solvalou*, 'and although we're still using versions of that hardware in recent games like *Air Combat* and *Cyber Sled*, not only does it rely on a 16bit CPU but it lacks the texture-mapping and high-speed geometry of System 22. In terms of polygons it's capable of handling 1000 polygons every 1/60 second, whereas System 22 can handle 4000 every 1/60 second. Basically, we've improved the engine geometry by 10 times in System 22, making it possible to generate 240,000 polygons a second, compared to 60,000 a second on System 21.' But exactly what kind of kit are we talking about here? Parallel processing? Digital signal processing? Unfortunately, Namco aren't particularly keen to discuss specific details about their hardware, but they are prepared to tell us that 'the architecture is very similar to that of a graphic workstation, but with an emphasis on realtime response, so there is direct feedback for the player.' (A quality that keen **Edge** readers will notice is shared by Sony's PS-X, incidentally.)

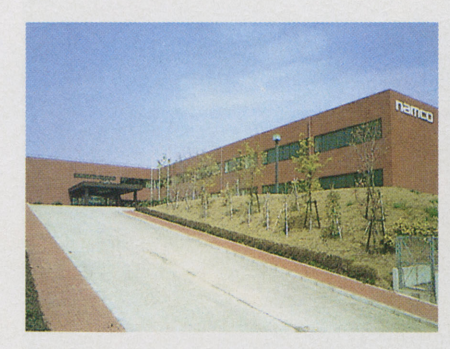
And the CPU? 'The CPU isn't that fast on its own, but it doesn't need to be. It's a 32bit Motorola 68020 running at 25MHz, but it has digital signal processing, using Texas Instruments 320TI DSPs.' This goes some way to explain how it manages to calculate over 400 million FLOPS (floating-point operations per second). As far as display is concerned, 'the game operates in a 640x480 interlaced resolution and uses 30,000 colours onscreen at once, despite being capable of showing all 16.7 million. The video code is 24bit, but it doesn't use an Alpha Channel.'

'We think we can make a 100% translation of *Ridge Racer* to the PS-X'
Youichi Haraguchi, Namco

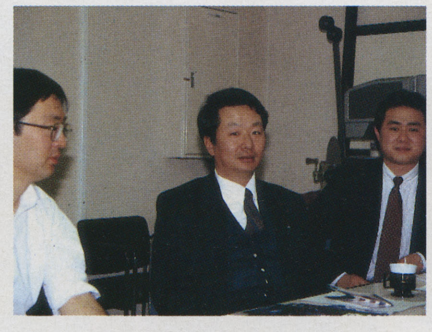
The amount of memory a graphically intensive game like this eats up is huge; while plain polygons normally take up very little room, highly textured and shaded polygons are notoriously byte-hungry. And in the same way that the texture-mapped PC game *Strike Commander* chomps a big chunk out of a hard drive, *Ridge Racer* requires a stack of ROM chips to make it run. 'Graphics, sound and code take up between 150 and 160 megabits [around 20 megabytes],' reckons Tashiro, 'although we didn't arrive at a specific figure. The detailed textures take up a lot of space.' (The textures were rendered, like most of the graphics, using Softlmage's *Explorer* package on Silicon Graphics hardware.)

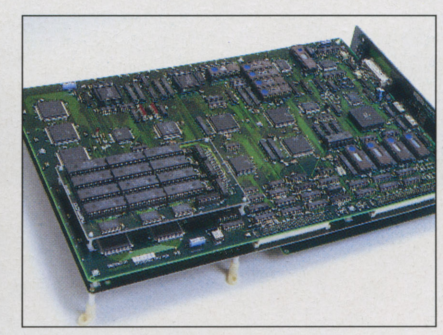
With Sega in the process of introducing a potential rival for *Ridge Racer* in the form of *Daytona GP*, how do Namco rate their main rivals in the coin-op market? 'In terms of hardware technology we think we are one year ahead of Sega,' says **Noby Kasahara**, section chief of international sales. 'Their finished game hasn't been released yet, but personally, we think System 22 performs better.' And the latest version of *Daytona USA* seen at the Japanese AOU show, although brilliant, bears him out. So, if Sega holds no fear for Namco, does Nintendo's Project Reality hardware pose a threat? Not directly, in their eyes: 'We think they will not make any hardware for the arcade, but will simply license the technology to other companies.'

But Namco aren't just dedicated to making big, expensive coin-ops. Last November, they signed an agreement with Sony to develop software for their powerful new PS-X home system, scheduled for release in December. (In return, Namco will use PS-X hardware for future arcade projects.) Their first PS-X game will, unsurprisingly, be *Ridge Racer*. However, **Youichi Haraguchi**, a general manager in Namco's consumer (console) division, can't confirm whether the PS-X version will be exactly the same as the coin-op: 'Not all of the development tools have been delivered by Sony yet, and we need to see what they can provide us before we start any proper work. But given the power of Sony's hardware, we don't think it will be that difficult to convert, and we should be able to do it in the time we have. Technically, we believe we can make a 100% translation.' →

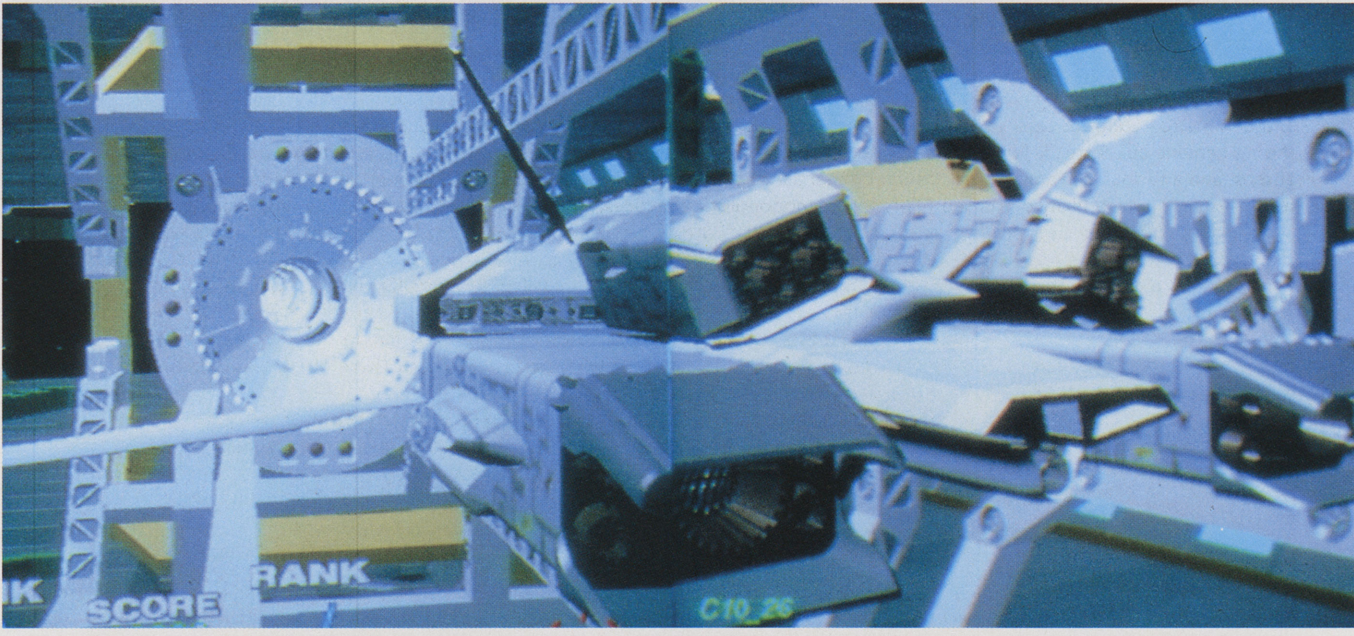


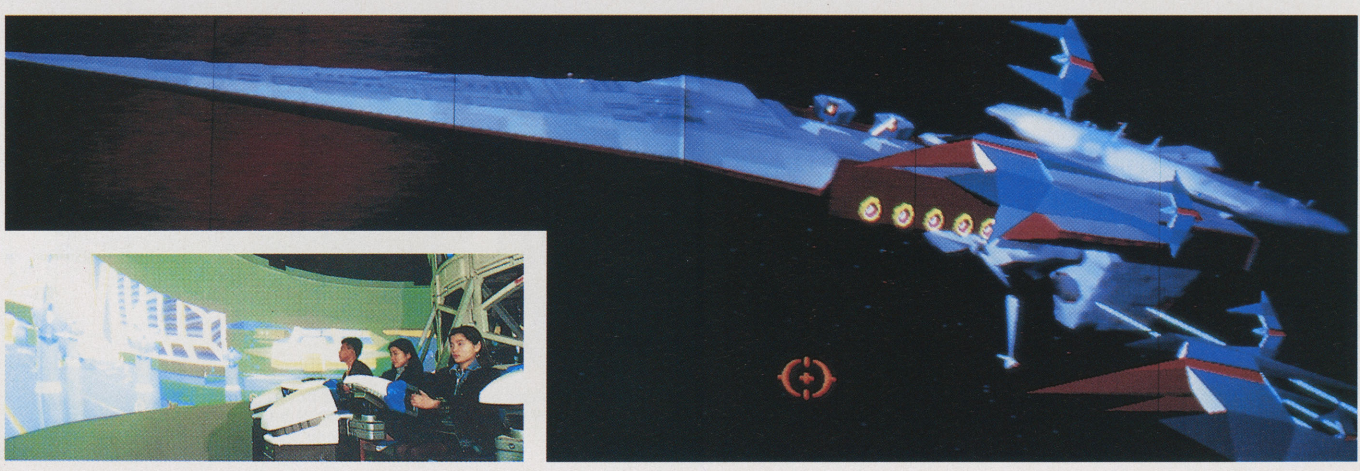
To discourage Edge from wandering around taking unapproved photographs, Namco kindly laid on transport to the station


Inside R&D: from left to right, Koichi Tashiro (CG development dept), Noby Kasahara and Youichi Haraguchi (consumer sales)


The System 22 board includes a piggy-back 160 megabit ROM board that conveniently obscures Namco's custom graphics processor

Namco's gratuitously lavish *Galaxian*^{3} combines background images pulled off LaserDisc with realtime foreground sprites





← But surely the existence of a home system with the ability to emulate a state of the art coin-op is not exactly good news for an company with a huge investment the arcade business? Haraguchi seems unperturbed: 'We're not worried about this because by the time we have *Ridge Racer* ready for the PS-X – maybe in 10 or 12 months' time – we'll have moved on with our arcade games to even more exciting things. Currently we are trying to improve System 22 to provide even greater performance, but we are also working on other technologies.'

And Namco have plans for other console formats, too. While existing development focuses on formats like the SNES and PC Engine, the company naturally regards its future as lying with 32bit systems. **Noby Kasahara**, section chief of international sales, says: 'We are confident about Sega's Saturn and Sony's PS-X, but we're still unclear about the specifications of some machines, so we do not know their exact performance. We'll try to develop software for all the next-generation machines, but we'll probably eventually focus on one. Currently we are undecided only about NEC's FX, but machines like 3DO are risky too. Nobody knows just how successful 3DO can be and we don't think it will be an easy platform for us. We'll continue our development on the machine, but we can't honestly say we expect to make a profit on 3DO in Japan.' But whichever format prevails, Namco's increasing commitment to the consumer market should provide them with something to fall back on if the the coin-op industry suffers any serious downturns in the future.

Namco's involvement in the console sector didn't start with PS-X, however; it began in 1978 with the licensing of coin-op games like *Pac-Man* to companies such as Atari and Bally Midway, But the big crash of 1983 – in which Atari anticipated huge market growth and manufactured more copies of *Pac-Man* for their VCS machine than there were players! – left the industry in complete disarray.

In 1984 Namco were given an unprecedented opportunity to develop software for the Famicom (the Japanese NES). No company had previously been allowed to produce software for Nintendo, but Nintendo president Hiroshi Yamauchi chose to bestow this honour on Namco. Nakamura's company immediately profited from the explosion in the Japanese Famicom market: so vibrant was the new 8bit format that the Famicom conversion of *Xevious* sold a staggering (for the time) 1.5million copies, which alone provided Namco with enough cash to buy an entire office block. This has since been nicknamed the 'Xevious building'.

'We can't honestly say we expect to make a profit on 3DO in Japan'
Noby Kasahara, Namco

Unfortunately, Namco's special relationship with Nintendo came to an abrupt end five years later when the Nintendo contract expired. Nakamura had expected the association to be cemented with a renewal of the agreement but instead, Nintendo relegated Namco to the standard terms accepted by all their subsequent licensees, and a furious Nakamura committed commercial suicide by speaking out against the all-powerful Nintendo. After a failed lawsuit, in which Namco accused Nintendo of monopolistic practices, Nakamura found himself in the unenviable position of having to crawl back to Yamauchi to accept the terms, with all the privileges previously enjoyed by the company withdrawn.

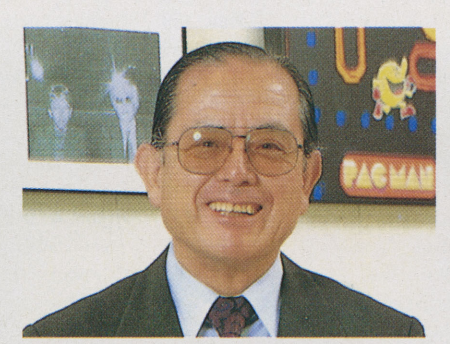
Namco had to acknowledge the fact that without Nintendo they could not survive; by this time 40% of their business depended on Nintendo, and despite contracts with Sega and NEC for developing Mega Drive and PC Engine software, Namco's destiny in the home videogame industry lay at the feet of Nintendo and their 95% stranglehold on the market.

Of course, a Namco home machine was always anticipated – plans existed for an number of years; however with Matsushita, Sanyo and now Sony entering the console market, Namco have decided that there simply isn't room.

It was in 1972 that Namco's interest in the coin-operated videogames market began. Atari's Japanese subsidiary had been suffering heavy losses in Japan, and several coin-op companies, including Sega (who manufactured pinball tables and jukeboxes), expressed an interest in buying it. Nakamura saw a great future in the company and regarded it as a way to get out of amusement rides, and while figures of around $50,000 were bid by most companies, including Sega, Nakamura offered an outrageously high $800,000. His decision proved a wise one: subsequent →



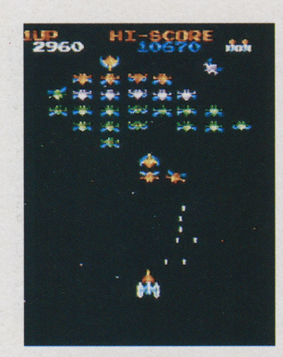
One of Namco's three buildings – their corporate headquarters was entirely funded by the profit from *Xevious* on the Famicom

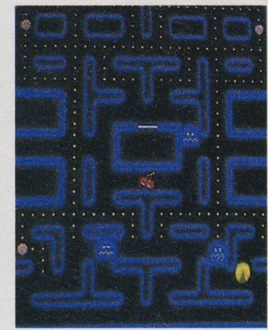
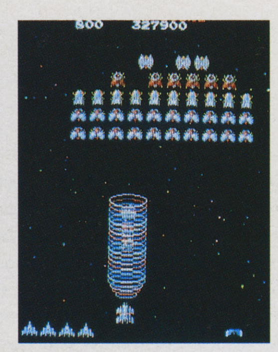


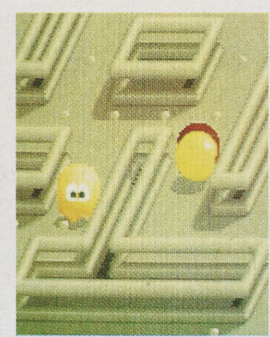
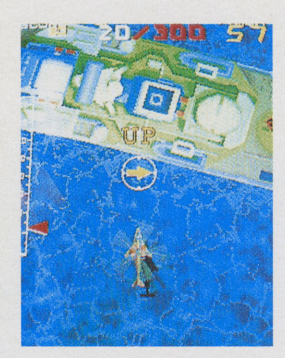
Namco's chairman and CEO, Masaya Nakamura, is also president of the JAMMA coin-op trade association in Japan



Namco's first big Famicom sellers included the likes of *Galaga, Pac-Man* and *Mappy*. Those golden days didn't last long, though

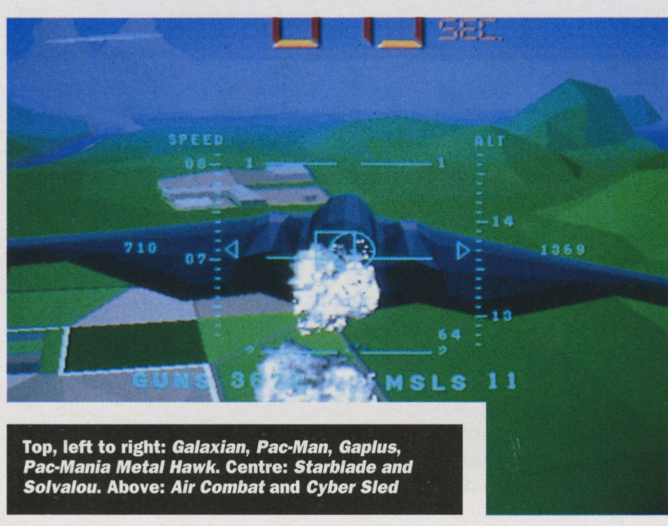










Top, left to right: ***Galaxian, Pac-Man, Gaplus, Pac-Mania Metal Hawk.*** **Centre:** ***Starblade*** **and** ***Solvalou.*** **Above:** ***Air Combat*** **and** ***Cyber Sled***

Namco's game history

Oct	**'79**	Galaxian
Feb	**'80**	Navarone
Feb	**'80**	SOS
July	**'80**	Pac-Man
Jan	**'81**	Rally-X
July	**'81**	Warp & Warp
Sep	**'81**	Galaga
Nov	**'81**	Bosconian
Mar	**'82**	Dig Dug
Sep	**'82**	Pole Position
Sep	**'82**	Super Pac-Man
Feb	**'83**	Xevious
Oct	**'83**	Pole Position II
Apr	**'84**	Gaplus
Aug	**'84**	Pac-Land
Mar	**'85**	Dig Dug II
May	**'85**	Metro-Cross
Dec	**'85**	Sky Kid
Dec	**'86**	Rolling Thunder
Apr	**'87**	Shadow land
Jun	**'87**	Dragon Spirit
Nov	**'87**	Pac-Mania
Dec	**'87**	Galaga '88
Apr	**'88**	Assault
Sep	**'88**	Ordyne
Oct	**'88**	Metal Hawk
Oct	**'88**	World Court
Nov	**'88**	Splatterhouse
Feb	**'89**	Phelios
Feb	**'89**	Winning Run
Jul	**'89**	Dirt Fox
Nov	**'89**	Burning Force
Nov	**'89**	Four Trax
Dec	**'89**	Dangerous Seed
Feb	**'90**	Marvel Land
Aug	**'90**	Final Lap 2
Dec	**'90**	Dragon Saber
Feb	**'91**	Driver's Eyes
Mar	**'91**	Rolling Thunder 2
Mar	**'91**	Steel Gunner
Sep	**'91**	Starblade
Dec	**'91**	Solvalou
Mar	**92**	Steel Gunner 2
Mar	**'92**	Cosmo Gang: The Video
May	**'92**	Suzuka 8 Hours
Sep	**'92**	Final Lap 3
Nov	**'92**	Cosmo Gang: The Puzzle
Dec	**'92**	Exvania
Feb	**'93**	Galaxian^3 (6-player)
Feb	**'93**	Super World Court
Mar	**'93**	Knuckle Heads
Apr	**'93**	Lucky & Wild
Jul	**'93**	Air Combat
Sep	**'93**	Cyber Sled
Sep	**'93**	Numan Athletics
Oct	**'93**	Ridge Racer
Nov	**'93**	Suzuka 8 Hours 2
Feb	**'94**	Final Lap R
Feb	**'94**	Tinkle Pit
Feb	**'94**	Nebulas Ray

← international sales increased 100-fold, fuelling Namco's growth.

Since 1978 Namco have produced more than 120 coin-ops. Their first foray into the market was the lightgun clay pigeon shooting game, *Shoot Away* – these machines can still be found in older seaside arcades. However, it was the 1979 game *Galaxian*, with its colourful graphics, that most gamers will remember; injecting skilful gameplay into the overpopulated space invaders market, *Galaxian* was a huge success, and follow-ups like *Galaga* and *Gaplus* gained similar cult followings.

But the game that propelled Namco to the forefront of the coin-op scene was *Pac-Man*, in 1980. The initial game series reputedly brought in hundreds of millions of dollars for the company. This was the second big craze the videogame industry had seen after *Space Invaders*, and it was also a game that Atari converted for their VCS console. According to David Sheff's book, Game Over, Nakamura awarded the game's designer just $3,500 for his achievement; needless the say, the man in question left the videogame industry in disgust shortly afterwards.

Throughout the mid-1980s, Namco continued to release quality arcade games and coin-ops. Games like *Pole Position, Pole Position II, Pac-Land, Metro-Cross, The Tower Of Druaga* (which proved a massive hit on the Famicom) and *Rolling Thunder* continued to rake in the coins, providing Namco with enormous R&D budgets for future hardware development. The first fruits of this investment were *Assault* and *Metal Hawk*. Neither game was a big commercial success, but no-one could deny the technical excellence on display. For the first time an arcade game had fullscreen background and sprite rotation, seen later (in less impressive form) in the helicopter sections in SNES *Pilotwings*. *Metal Hawk* was particularly impressive with its rotation and scaling of huge sprites, but the high cost of the units prevented it from being widely distributed.

Namco's revolutionary coin-op hardware even made it into standard PCBs like *Ordyne*, complete with brilliant rotation, but by the late '80s they had set their eyes on the future of computer graphics: polygons. *Winning Run* was released in early 1989 and was the first coin-op driving simulator to include dedicated polygon generation (Atari's *Hard Drivin'* was primarily PC-based). *Winning Run*, which relied on Namco's System 21 Polygonizer, was a huge advance over conventional 3D graphics performance. Again, the high price of the unit (boosted by one of the best sit-in hydraulic cabinets around) meant that *Winning Run* didn't get off to a good start compared to the spectacularly successful *Final Lap* coin-op, which had appeared a year previously. *Final Lap* used cheaper conventional sprite technology but allowed arcade owners to link up to eight units together for great multiplayer racing. *Final Lap 2* and *3* continued the family line.

Pac-Man propelled the company to the forefront of the coin-op scene

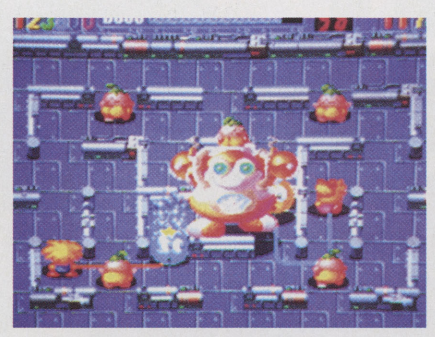
System 21 was put to the test in later coin-ops. These included another version of *Winning Run, Winning Run Suzuka GP* (it failed to make it to the UK); the initial singleplayer version of *Galaxian*³; *Driver's Eyes* (a threescreen game similar to *Winning Run*, although more jerky); *Starblade* (the game that inspired *StarFox*, with LaserDisc backdrops); *Solvalou* (the sequel to *Xevious*, employing smooth realtime backdrops); and more recent additions like *Air Combat* and *Cyber Sled*.

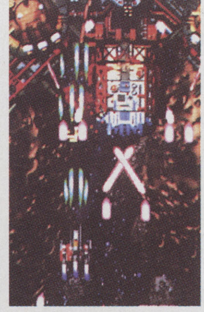
So where do Namco see the coin-op market going? 'For us,' says Noby Kasahara, 'the future of the coin-op market lies just as much with true computer graphics, as in commercial movies like *Jurassic Park* and *Terminator 2*, as it does with realtime images. Of course, there are also possibilities to increase the number of polygons, and develop antialiasing techniques – these are the technologies we are aiming to develop.' Namco are also expanding their theme park business; the company's Tokyo Wonder Eggs park will soon be joined by the Magic Edge Entertainment Center in California, funded by Namco and stocked exclusively with their latest hardware – including the *Hornet 1* VR system, a flight simulator powered by Silicon Graphics technology and developed with computer graphics pioneers Evans & Sutherland.

The big question over Namco's future is whether the company will sideline its coin-op business and concentrate on the console market as hardware performance increases. The signing of the PS-X deal has shown the company willing to play a part in the 32bit console revolution; with the hitherto dominant Nintendo looking increasingly marginalised, perhaps the way is now clear for a Sony/Namco partnership to take the console sector by storm. ■

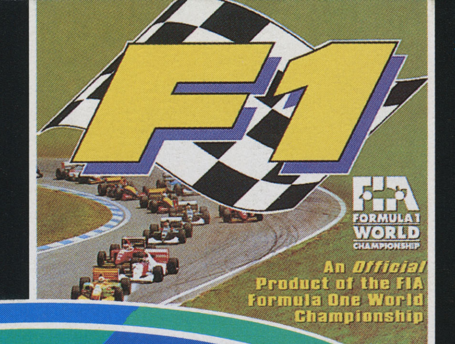


Final Lap R **is Namco's latest addition to the multiplayer series. This game made its debut at the AOU Show (see news report)**


Tinkle Pit **marks Namco's commitment to cute character games. Games like this have boosted female arcade attendance in Japan**



Nebulas Ray **is a welcome return to the dated but enjoyable vertical shoot 'em up, boosted in this case by some exquisite graphics**

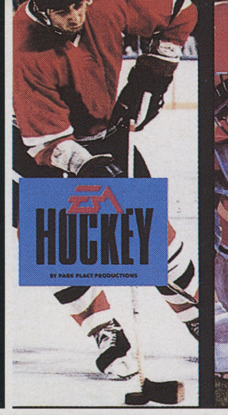
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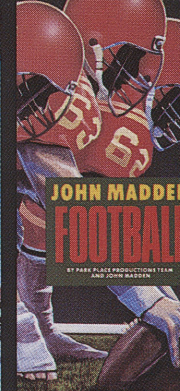


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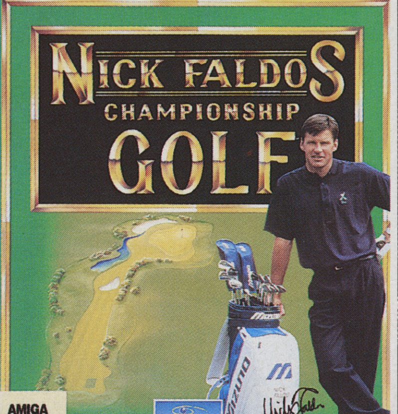








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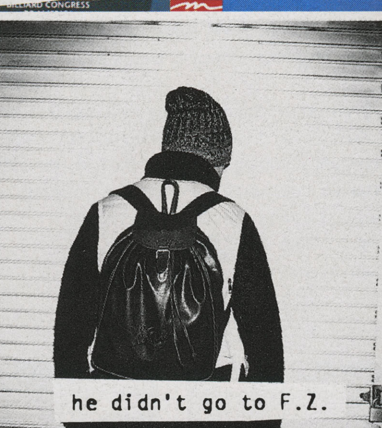




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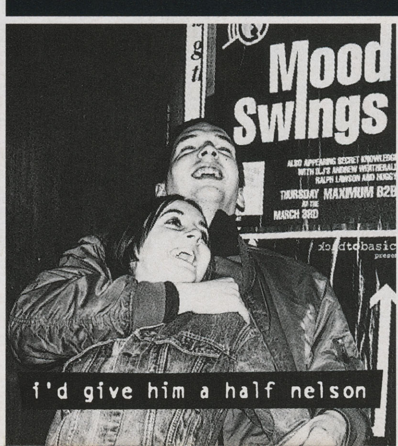
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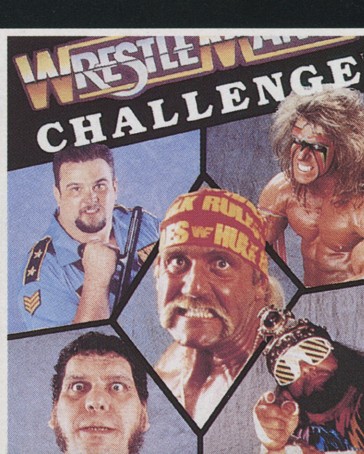
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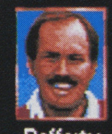
the games people play

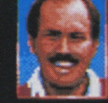








Ballesteros Lyle Langer Rafferty Montgomerie



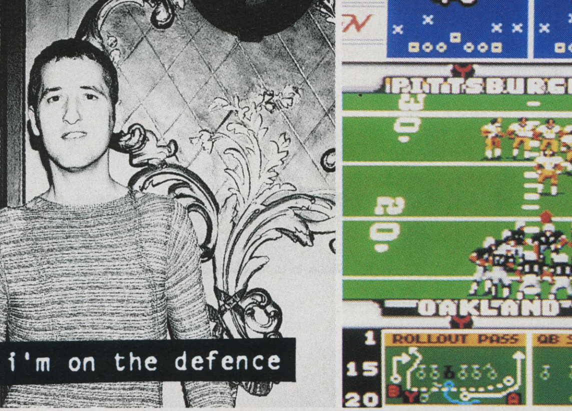




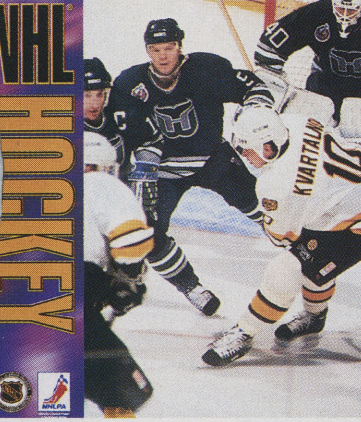


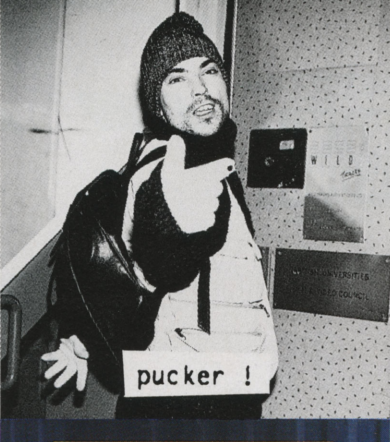


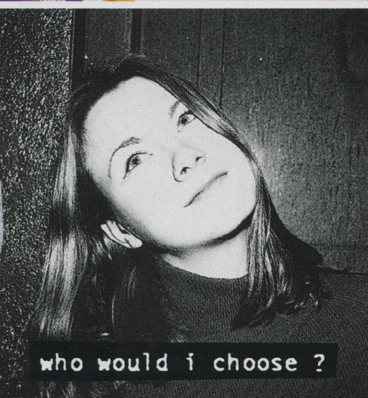

Olazabal Rocca Shoot-Out & Match Play Davis Johnstone

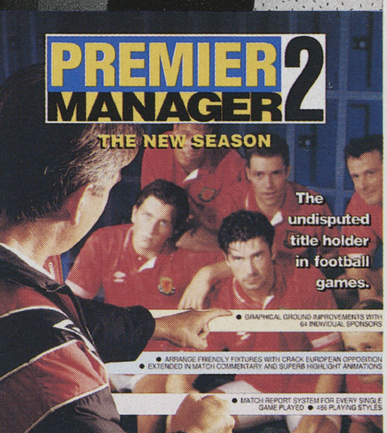


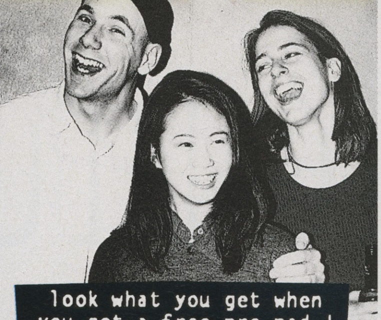














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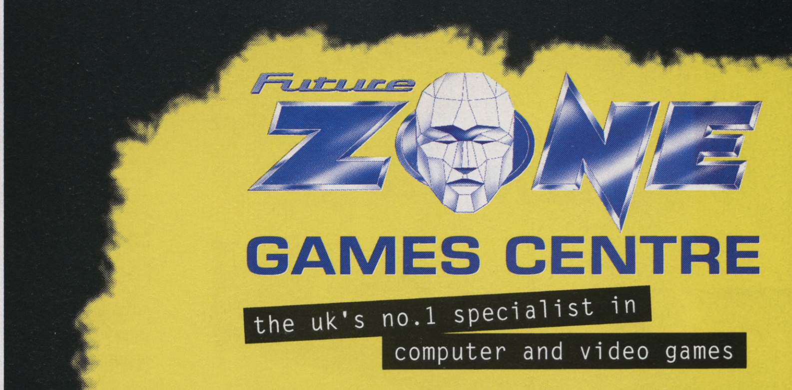
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The Professional

G O L G O 13

Nationality..... Unknown
Age............... Unknown
Name............ Unknown
CODENAME... GOLGO 13

The American security forces have successfully crushed Golgos 1-12,

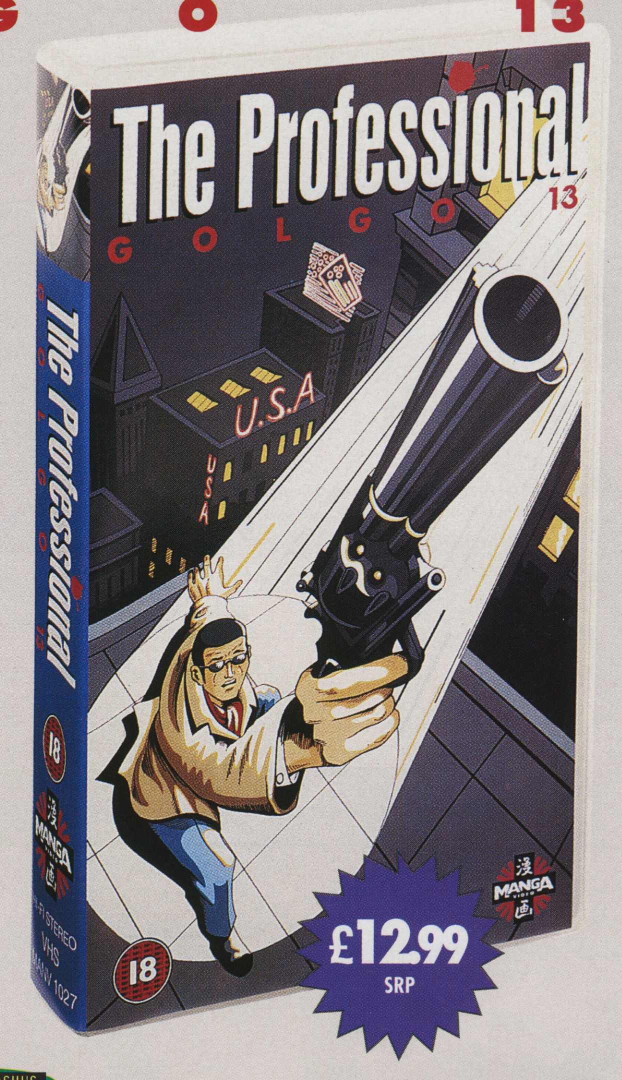




but can they stop the elusive number 13? Shrouded in mystery and anonymity, Golgo 13 is indestructible to his enemies and irresistible to women.
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Testscreen

66 John Madden 3DO
72 Sub-Terrania MEGA DRIVE
74 Ultimate Tiger FM TOWNS MARTY
78 Tempest 2000 JAGUAR
82 Virtua Racing MEGA DRIVE
86 Spin Masters NEO GEO
88 Strider ARCADE

Once again it's time to re-examine the state of the videogaming art.

And, surprisingly, it's a good month on the Mega Drive with *Virtua Racing* – an able racing game (although not as arcade-perfect as Sega would have you believe) – and *Sub-Terrania*, a good-looking and playable shooter, which delivers the goods *without the* need for extra processing power.

And, equally surprisingly, there's still little quality software on the SNES. *Fatal Fury 2* is proving popular in Japan, but it's no great shakes and therefore absent from our pages.

3DO and Jaguar finally come of age with *John Madden Football* and *Tempest 2000* – aesthetic tours de force and brilliantly playable, but worryingly unoriginal.

So the games field remains shy of anything even vaguely new or mouldbreaking. **Edge**'s lonely vigil continues...

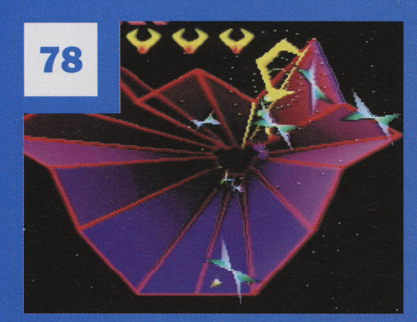


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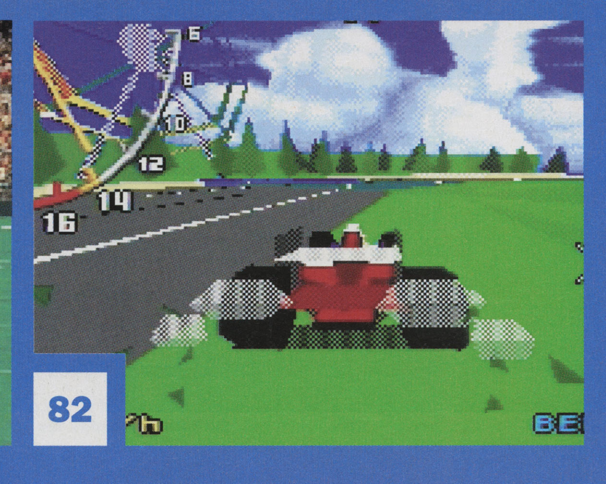



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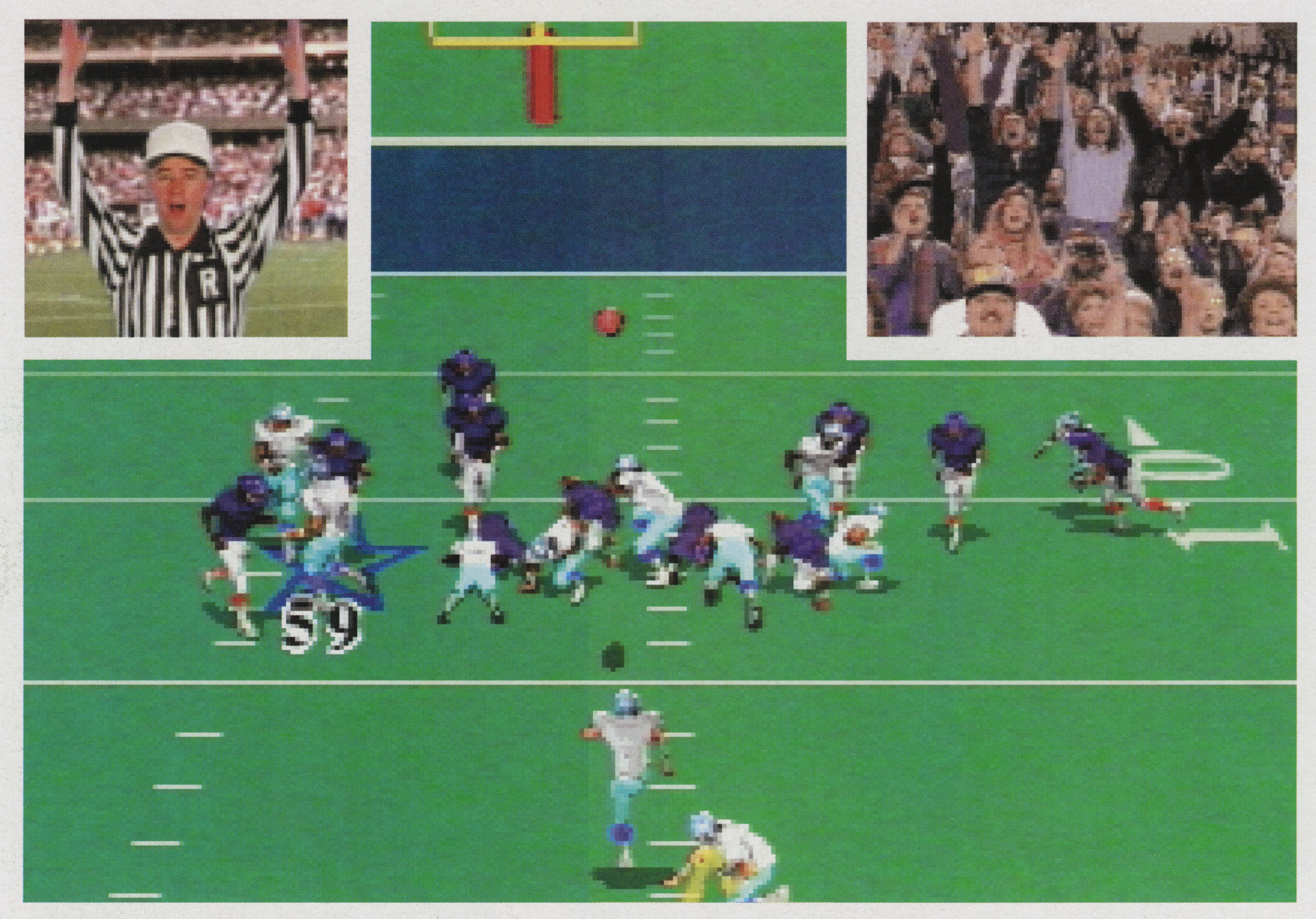
John Madden NFL '94 Football

Format:	3DO
Publisher:	EA
Developer:	In-house
Price:	£50
Size:	1 CD
Release:	Out now (US)

Remember the Mega Drive? It played host to a cartridge called *John Madden Football* which was rated by many as the best game ever (and was subsequently converted to the SNES and PC). The 3DO version faithfully reproduces all of the playability, depth and excitement of the Mega Drive game, but has one crucial difference: the graphics are mind-blowing.

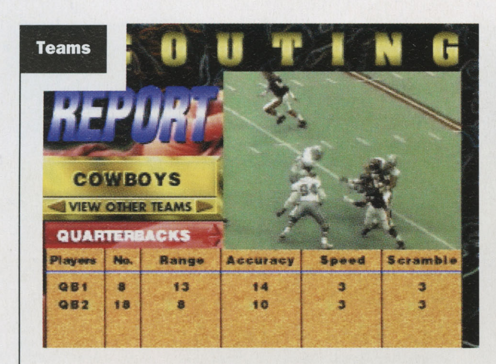
Digitised players are animated with breathtaking precision, at a resolution that adds an extra degree of believability to the action. With this new veneer of graphical detail, every collision is twice as painful, and every touchdown twice as thrilling. To bolster the effect of the visuals, the sound has also been improved. This sensory onslaught is utterly enthralling; 3DO *John Madden* is easily the world's most realistic sports simulation, and sets a new standard for CD-ROM games in any genre.

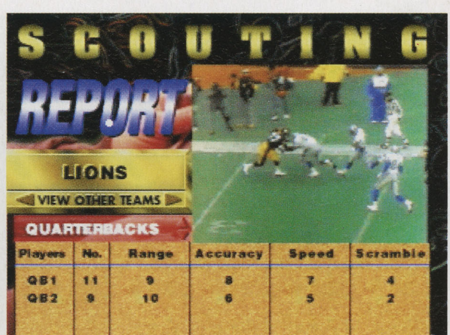
Of course, the sport of American football is a perfect candidate for a videogame, demanding a combination of physical and mental prowess that translates particularly well to the medium; both strategy and arcade skills can be combined to provide a varied and involving experience. In addition, the rigid structure of the sport – consisting of bursts of intense action punctuated by periods of unpressured deliberation – means that a game like *Madden* can capture the drama of



British gameplayers who complain that American football is too complex need only take five minutes to pick up the basic rules. An appreciation of the niceties of strategy comes later, but the basic principles are actually extremely simple. And it's *so* exciting...

Teams







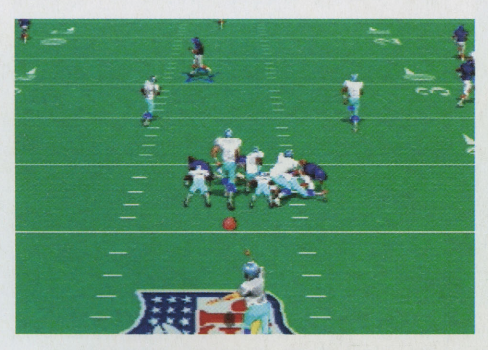


Video clips show the Dallas Cowboys and Detroit Lions in action (top). The home arenas of the Washington Redskins and Denver Broncos have been helpfully digitised for your entertainment (above)

Teams

Full National Football League sponsorship is central to *John Madden*'s success. Without the support of the NFL, Electronic Arts would have been unable to use the team names and insignia that are such an important part of the sport. As well as detailed statistical information on every player in each team, the game offers a wealth of additional background material that contributes real atmosphere and helps to produce the enthralling 'television' illusion: there are video clips of each team in action, as well as a digitised image of each stadium, and the team's colours are reproduced on the players' uniforms and helmets.

Continued next page



The defensive line holds off the attacking forwards, giving the quarterback time to lob a well-aimed pass to a wide receiver

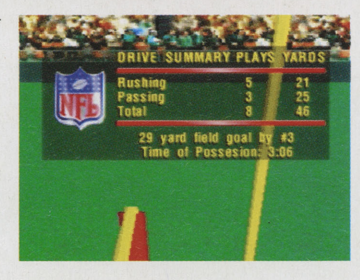


All the features that have always set *John Madden Football* apart from its inferior competitors are still present – the wealth of statistics and the amusing weather options are particularly familiar

the best action games without the intimidation of a non-stop challenge.

There's another aspect, however, that Electronic Arts have seized upon and developed with enthusiastic abandon for the 3DO version of their game. Now that the hardware is capable of recreating CD-quality audio, convincing video footage and full-colour graphics, the techniques of television sports coverage can be properly exploited. EASN – Electronic Arts' sports brand – has always aspired to couch the action in a familiar TV vernacular, but only with 3DO *Madden* have these attempts been fully realised.

The spectacle and hyperbolic excitement that is so much a part of American football has been captured by a comprehensive assortment of impressive features. After a captivating intro, combining full-motion video with some smartly rendered graphics, the digitised image of John Madden himself comes to life, with the first of his entertaining comments – which continue throughout the game. Spurious but amusing elements – video clips of each team in action and footage of the referee – are



Replays

Madden's most amazing feature is undoubtedly its outstanding action replay mode. Events can be replayed forwards or backwards, paused, or jogged frame by frame. All of this was seen in the other versions, but the flexible control over the viewpoint is unprecedented. The 'camera' can be placed behind any player on the field, then tilted up or down at any angle. In addition, you can zoom in – to a couple of yards behind the selected player – or pull right back, to a 'blimp's eye' view of the entire stadium. This is more than just a gimmick: precise observation of individual players' actions is an invaluable aid to strategy, and the play moves at such a blinding pace that it's absolutely necessary for a thorough appreciation of the action. The impressively detailed player graphics have a real solidity as you move around them, enhancing the sense of space that has always been *Madden*'s strength.



Replays

An already impressive long pass can only be properly explored and appreciated in action replay mode. As the quarterback pulls back his arm to make the throw, the virtual camera zooms out, switches focus to a midfielder, pulls right out to blimp view, then moves back in to follow the fleeing receiver

complemented by more significant features, including complete statistics on every team, as well as music, crowd noise and an image of every home stadium. This loving attention to detail is what makes *Madden* a magnificent piece of entertainment.

Unusually, though, all this polish doesn't serve simply to cover up a mediocre, uninteresting game; *Madden* is by no means all show and no go. The addictive playability and intriguing depth that has distinguished the game in all its previous incarnations is abundant in this latest version. Indeed, *John Madden* on the 3DO is even slicker than before – it's certainly much faster, despite the increased graphical complexity.

The game has only one disappointing limitation: the tournaments are hopelessly inadequate, which significantly lessens the appeal of the oneplayer game – but there's still enough entrancing presentation and honest to goodness playability to keep a solo player coming back time after time – and the twoplayer contest is unrivalled.

The message is clear: buy *John Madden Football*. Then buy a 3DO to play it on. When history recalls the product that 'made' the 3DO, and finally sent the videogame industry scurrying down the street marked 'multimedia', it will recall *John Madden Football*. When conversation turns to a discussion of the most impressive console game of the year, it will turn to *John Madden Football* on the 3DO. This isn't just a game; it's a phenomenon.

Edge rating: **Nine** out of **ten**



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Sub-Terrania

Format:	Mega Drive
Publisher:	Sega
Developer:	Zyrinx
Price:	TBA
Size:	16 Mbits
Release:	April

The Mega Drive has been around for over six years now, in one form or another. So you would have thought that someone could have come up with a really good shoot 'em up for the system in that time – especially when you consider that the shoot 'em up is one of the most popular game genres ever. But unfortunately, that hasn't been the case.

Ignore what others may tell you: games like *Hellfire* and *Gynoug* never really took advantage of the Mega Drive's capabilities, and the *Thunderforce* series – although technically accomplished – seemed to lack that certain special something. But now, thanks to the efforts of little-known programming team Zyrinx, we finally have a Mega Drive shoot 'em up worthy of attention.



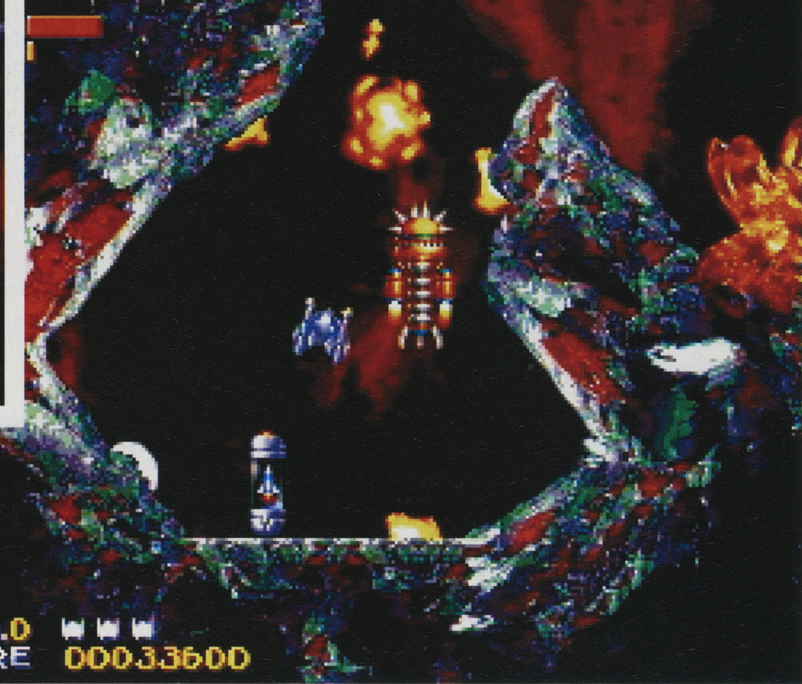
Getting past these web slingers is a tough task. If you're not careful, the spiders grab your ship and then hurl you at the enemy

Sub-Terrania thrusts you deep into the heart of an alien-infested mining site. You control an experimental attack ship and your task is to fly around a maze of caves rescuing any human survivors while wiping out the aliens. Okay, so it's the old 'alien invasion' scenario, but this story has a fantastic conclusion – which is that *Sub-Terrania* is great to play.

Unlike most shoot 'em ups, *Sub-Terrania* gives you time to get acquainted with the



This character conceals the location of the second sub-module. You need to find the missiles to destroy him



One of the many devious traps. An extra life icon is close at hand, but be careful – get caught underneath that spike-like creature and you'll be stomped to death

***Sub-Terrania* offers more than just mindless violence: this is what you have to go through to get one of the early sub-modules. 1 After finding a deflector, drop it onto the deflector truck. 2 To get rid of this laser wall, thrust downward onto this pressure pad (3). 4 The laser wall hides another deflector. 5 Carry the deflector over the deflector truck and drop it near this wall. 6 Deflect a laser bolt from the truck, towards the wall. 7 After the wall is destroyed, shut down the main laser. Shoot down through the pipes, aiming at the blue laser. 8 After the main laser is disabled, get another deflector. 9 Move over the truck again; if you've done it right, a laser from the main generator hits the deflector on the truck, bounces off towards your ship and then back again towards the main generator, destroying it. Now collect your sub-module (inset)**

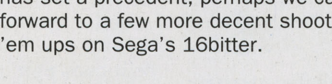
game. First it allows you to get to grips with the craft, and then it gradually introduces you to new elements of gameplay.

The first few levels are straightforward rescue missions: study the map, locate the humans, then rescue them. But your grey cells will be vigorously exercised by the time you reach level four. Laser barriers have to be overcome, valuable hidden objects found and bosses defeated. But although it's hard, it's not frustrating: you can always make progress, and that's why the game is so addictive.

Zyrinx have also put a lot of thought into the control of your craft. It feels a little cumbersome at first, but once you've got used to the handling, its high degree of manoeuvrability becomes apparent.

And fortunately, *Sub-Terrania* has some great graphics and sound to back up the gameplay. Some of the sprites are very impressive – especially the huge skull on level two – and no matter how much is happening onscreen, there's never any slowdown. The underwater sections are especially worthy of mention: not only do they look great, but they also affect the movement of your craft, slowing it down to dreamlike speed.

Sub-Terrania is quite simply a superbly structured and implemented piece of software: fast, clever, varied and, above all, addictive. Borrowing heavily from blasters from the past – *Oids*, *Thrust* and *Lunar Rescue* – it feels like a classic game yet breathes new life into the shoot 'em up genre. Now that *Sub-Terrania* has set a precedent, perhaps we can look forward to a few more decent shoot 'em ups on Sega's 16bitter.



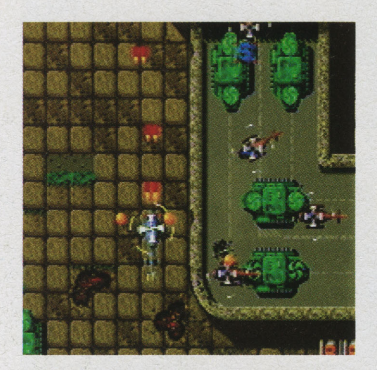
Edge rating: **Nine** out of **ten**

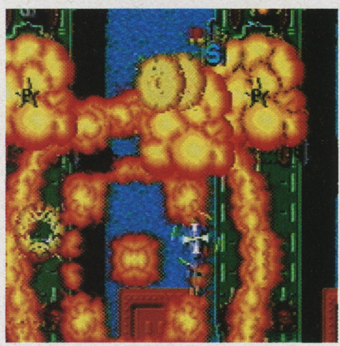


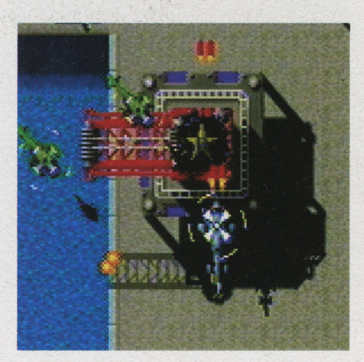
After collecting six sub-modules, you can travel underwater – but make allowances for the current

Ultimate Tiger

Format:	Fujitsu Marty
Publisher:	Ving
Developer:	In-house
Price:	¥8800 (£55)
Size:	1 CD
Release:	Out now (Jap)







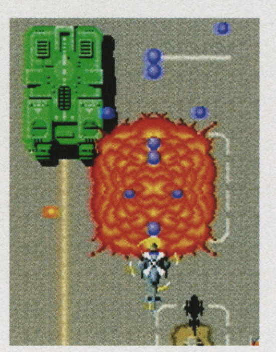
The armoured vehicles (top) take lots of hits – it's easier if you use a smart bomb (middle). Stars (bottom) contain bonus points



Vertically scrolling blasters don't get much tougher than this. A huge explosion fills the screen as a smart bomb is dropped



Take out these battleships' gun turrets first, then shower their hulls with fire



One of the many bosses. This one is about to spray a silly amount of bullets at the helicopter

While the 3DO and Jaguar battle for a slice of the videogame market, the FM Towns Marty continues to churn out arcade-perfect conversions of classic games. Some of them may look basic, but most play so well that it doesn't matter. And *Ultimate Tiger* is no exception.

Ving have done an admirable job of converting Toaplan's *Twin Cobra* coin-op to the Marty. Everything's here: the sprites, the sound, the speed, even the 'intelligent' power-ups that move tantalisingly close to your helicopter, then dart away at the last moment, luring you into the enemy's fire.

Considering the Marty's sprite power, a coin-op-perfect conversion of an ageing game comes as no real surprise. An equally good version of the game was released on PC Engine five years ago (on a 2Mbit HuCard); like the Engine version, there's no simultaneous twoplayer option here, but that's something shoot 'em ups rarely benefit from anyway

Unlike *Tatsujin 2*, *Ultimate Tiger* includes a tall vertical screen which simulates the coin-op's vertical monitor. Also, you can choose between two soundtracks and adjust the rate at which your helicopter fires. And for once, the infinite continues that would normally cripple lesser shoot 'em ups don't spoil the action: even with continues, you'll be lucky to get halfway through – it's that tough.

Playing *Ultimate Tiger* is a poignant reminder of just how skilfully crafted some coin-op shoot 'em ups were. Contemporary CD shooters like *Scavenger 4* might scrape bonus points for flashy graphics, but when it comes to sheer playability and 'feel good' gameplay, there still aren't many new blasters around that can touch this for thrills. Seven years old, too…

Edge rating: **Eight** out of **ten**

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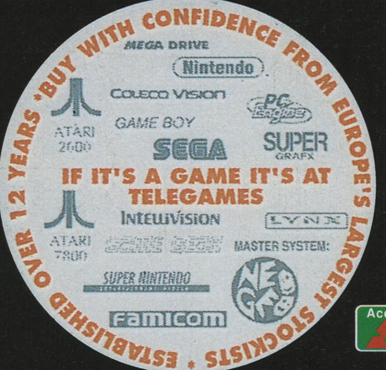
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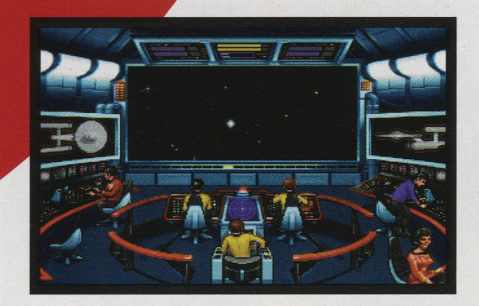
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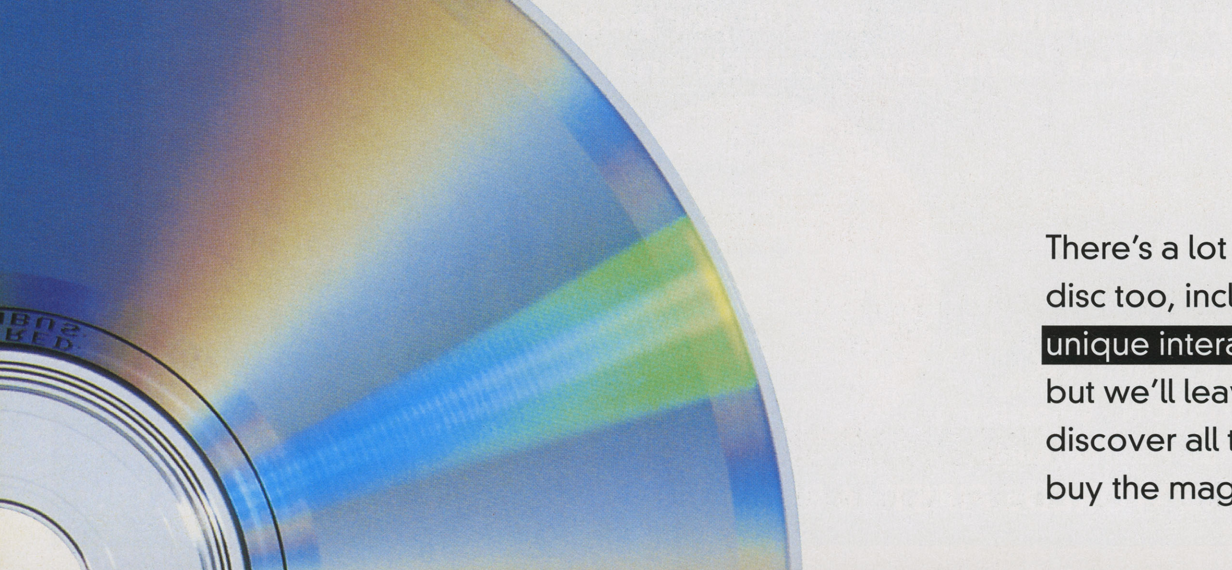
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Tempest 2000

Format:	Jaguar
Publisher:	Atari
Developer:	Llamasoft
Price:	£50
Size:	16Mbits
Release:	Out now (US)





With *Tempest 2000* (above), Atari have made good use of Jaguar's technology. Shame they still can't design decent box artwork (top)

Mention the words 'shoot 'em up' to a Jaguar owner and you're guaranteed to see a grimace as memories of *Crescent Galaxy* and *Raiden* come flooding back. In fact, just mentioning the word 'Jaguar' is enough to send many people into convulsions. But now, thanks to *Tempest 2000*, all that is set to change.

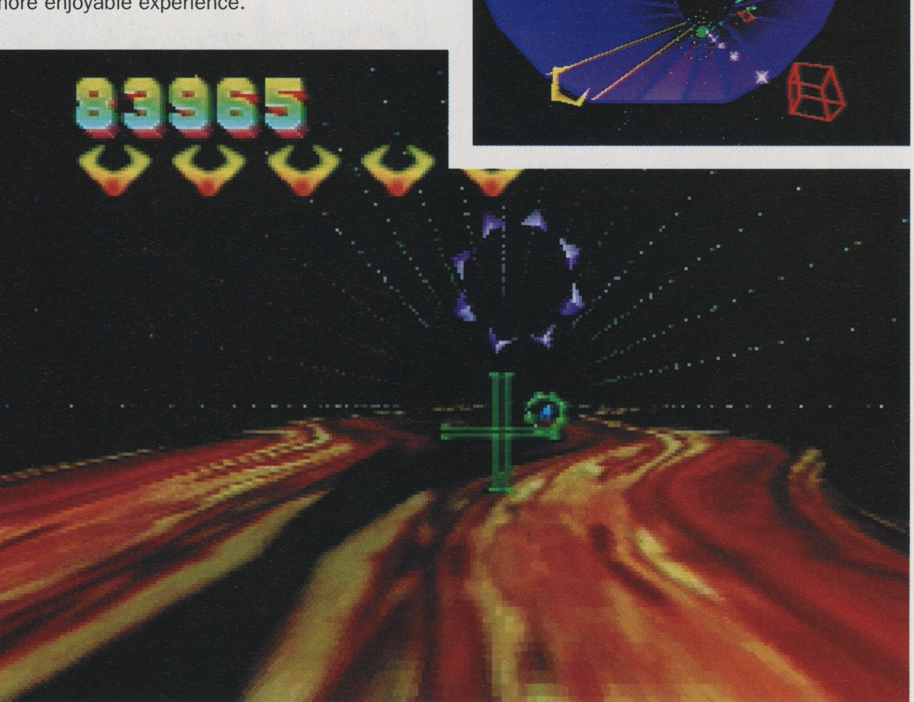
Back in 1981, the original *Tempest* was a huge arcade hit. Although simple by today's standards, the QuadraScan vector graphics were then revolutionary. These graphics, coupled with some of the most frantic shooting ever seen in arcades, ensured that *Tempest* would become a classic.

The man responsible for *Tempest 2000* is **Jeff Minter**, who was also behind some of the best 8bit blasters ever – *Batalyx*, *Revenge Of The Mutant Camels* and *Gridrunner* all bear his name. Instead of designing an entirely different game for *Tempest 2000*, Jeff has simply enhanced everything that made the first game so good. And it's paid off. All right, so the game might not look like a *Total Eclipse* or a *Crash 'n' Burn*, but it's actually an infinitely more enjoyable experience.

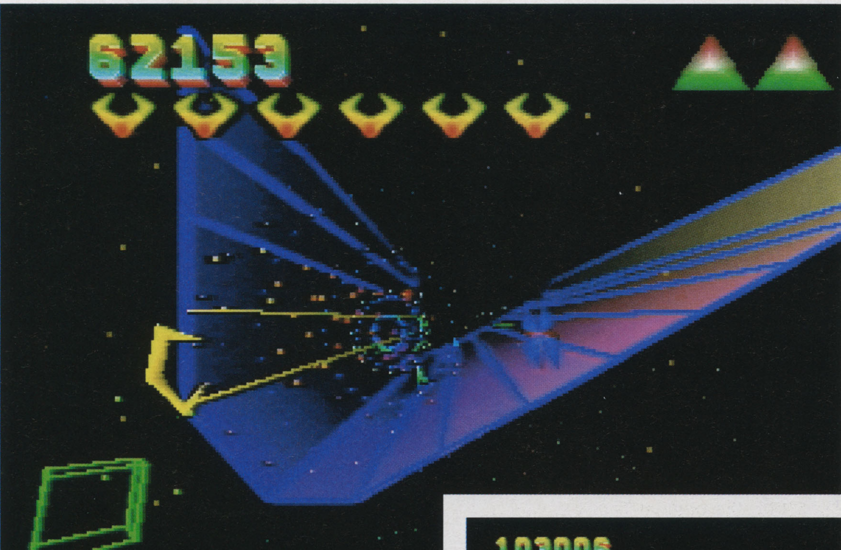
'I've always loved the pace and the sheer speed of the original game,' recalls Jeff. 'In fact, I liked the original game so much I bought one for my home.

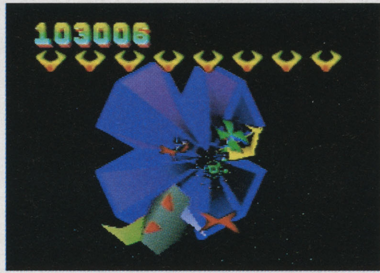
'It was only when I went to a Jaguar development conference that I realised this was my chance to make my own version of *Tempest*. Atari had prepared a list of games they wanted to see in development, and one of those was a 3D polygon shoot 'em up. So I went for it.'

Despite its colourful looks, you may think that *Tempest 2000* appears a little crude – especially if you compare it to some of the 3D polygon efforts we've seen lately. But all that's forgotten the moment the brilliant rave music kicks in and your Blaster is hurled

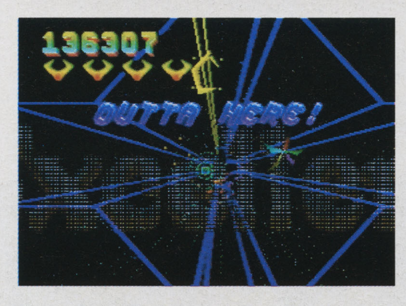


After collecting three 'warp power-ups' you're transported to this bonus level (above). Your task is to fly through these rings in the order they appear. Travel through all of them and you warp five levels ahead. The box droid (inset), which homes in on the aliens, is a valuable power-up





Webs may look simple (above) or incredibly intricate (right), but looks are deceptive: all the webs present a tough challenge



If you do well, the word 'Excellent' scales out of the web to fill the entire screen

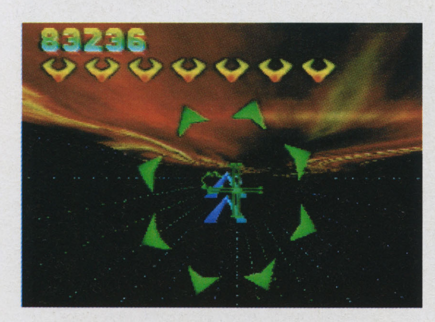
towards the first of the 100 webs. Within a few seconds, huge particle explosions begin to fill the screen, and the words 'Outstanding' and 'Excellent' bellow from the TV's speakers. Only then do you realise that *Tempest 2000* is a polygon game, but one with a difference.

According to Jeff, the music was all part of the original game design: 'I wanted to create a really frantic atmosphere with *Tempest 2000*. Although it plays fast, I wanted the music to suit the action. So I put together a videotape of the game and sent it over to the guys at Imagitek Design. I had dubbed over the action with a track I thought would suit the game, and they did the rest.'

And their efforts have borne fruit: *Tempest 2000* has the best Jaguar music yet. But when you consider that the tunes take up almost 1Mbit of memory, this is hardly surprising.

What is surprising, though, is that *Tempest 2000* also plays incredibly well. Admittedly, to onlookers the game seems horribly confusing, with thousands of particles flying all over the place and enormous words scaling 'out of' the screen. The main play area always seems obscured, but it's different when you play the game yourself. For some reason, you don't really notice what's going on around you; your eyes are fixed on your position on the web and nothing else. In fact, *Tempest 2000* has an almost hypnotic effect, sending the player into a trance which is only broken when the 'Game Over' legend appears.

As well as the normal web levels, there are three impressive-looking bonus sections. Collect three warp power-ups and you're treated to a 2001-style warp level. Although a simple challenge – just fly through the rings in the set order – they break up the frenzied action perfectly.

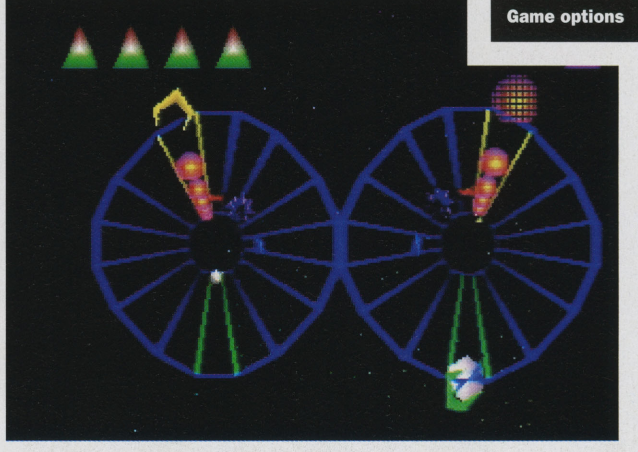


A speed-up icon looms at the start of the beautifully texture-mapped bonus level

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Tempest Plus allows you to team up with another player



Game options

Tempest Duel lets you go head-to-head with another player. A mirror on your Blaster deflects your opponent's shots back at them

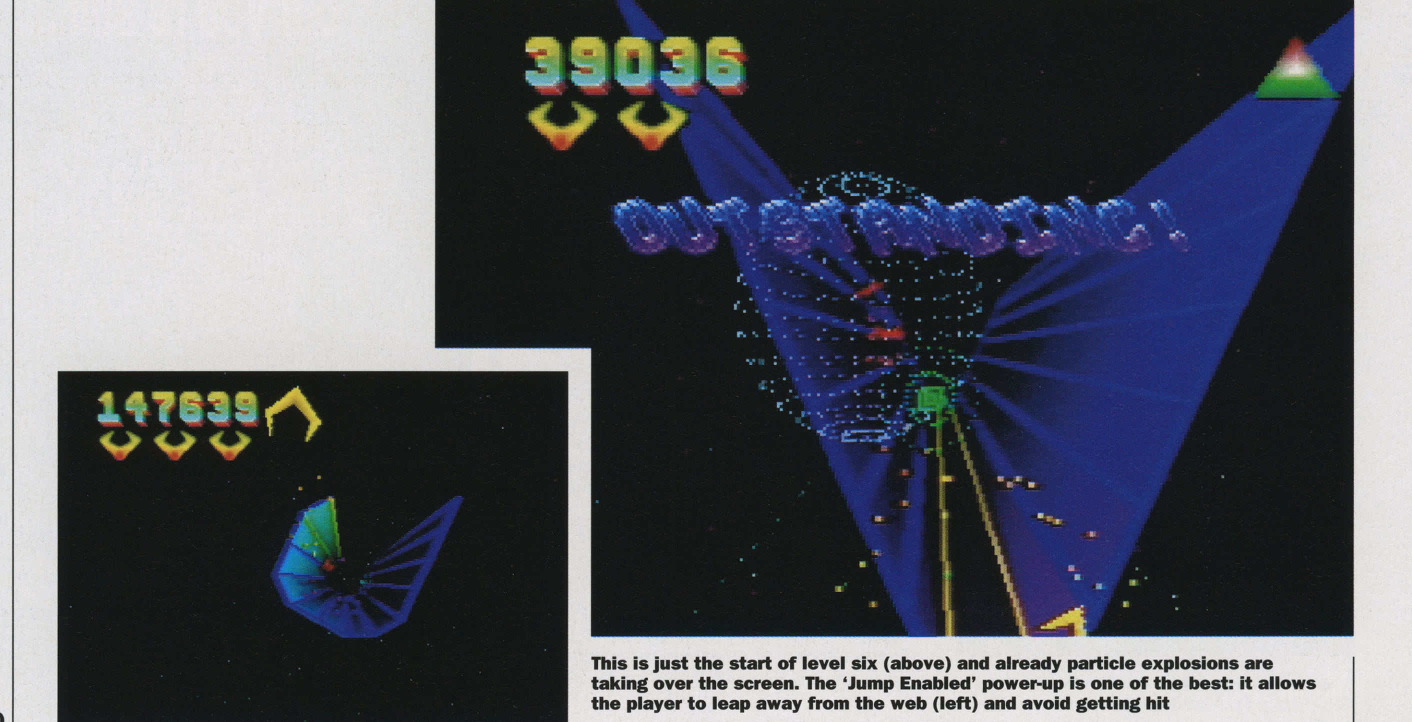
The outstanding *Tempest 2000* (above middle) and the rather boring-looking yet still playable *Tempest Original* (above)

Jeff created the bonus levels by manipulating the Jaguar's Graphics Processing Unit and Blitter. 'I've created my own version of SNES Mode 7,' he explains, 'but with a wiggle in it. Except there's no way a SNES or Mega Drive could do what the Jaguar's doing here: there's so much going on. There are far too many 3D particles shooting all over the place for those machines to even attempt it.'

As well as the updated version of *Tempest*, the *Tempest 2000* cartridge includes versions of other *Tempest* games: an exact copy of the arcade original; *Tempest Plus* (a combination of *Tempest Original* and *Tempest 2000*, where you can be joined by a partner); and *Tempest Duel*, where you and another human opponent battle it out on separate webs.

Tempest 2000 is a brilliant overall package: it's maddeningly addictive, furiously fast and amazingly playable. Jeff himself believes that 'To make a platform succeed, it needs great games. The public are crying out for great games, regardless of the system it's on.' And *Tempest 2000* is indeed a great game. In fact, it wouldn't be an exaggeration to say that it's one of the best all-out blasters ever created.

Edge rating: **Nine** out of **ten**



This is just the start of level six (above) and already particle explosions are taking over the screen. The 'Jump Enabled' power-up is one of the best: it allows the player to leap away from the web (left) and avoid getting hit

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6). **Keep records.** If you are buying by credit card, keep a note of the order and ask for an order number. When ordering anything over the telephone, always double-check the price.

7). **If you are sending a cheque,** keep a note of the cheque number, the date and the exact value. Make sure you know the exact name of the mail order company.

8). **When you receive your goods,** check them carefully. If anything is missing or faulty, contact the supplier immediately.

9). **Always order from the most recent issue** of Edge.

10) **If a problem does arise,** contact the supplier in the first instance. Calmly and politely tell them your problem. Most problems turn out to be minor hitches or misunderstandings that can easily be resolved. If you think you have a genuine grievance, contact your local Trading Standards Officer. The number is in the phone book.

Virtua Racing

Format:	Mega Drive
Publisher:	Sega
Developer:	In-house
Price:	£69.99
Size:	16 Mbit
Release:	May

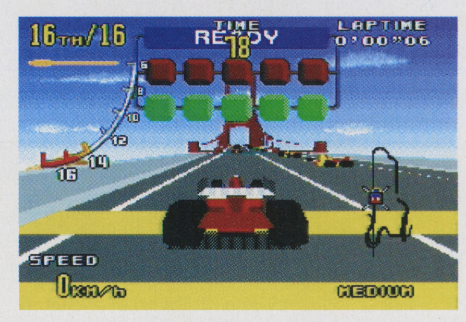
A month may not seem like a long time in normal circumstances, but in the competitive world of videogames it's an eternity. Just one month ago, Sega's Mega Drive had the look of an exhausted piece of technology: a machine just going through the motions, struggling to excite its existing userbase. But now, just one month on, things have changed. First came the news of the Mars project; then the superb *Sub-Terrania* was released; and now this has turned up – Sega's SVP-boosted *Virtua Racing*.

But let's get one thing straight: despite what may have been said elsewhere, this is not a perfect version of the arcade *Virtua Racing* squashed down into a Mega Drive cart. It is, however, a decent conversion – given the Mega Drive's limitations – of one of the best arcade racers ever made. Nothing more, and certainly nothing less.

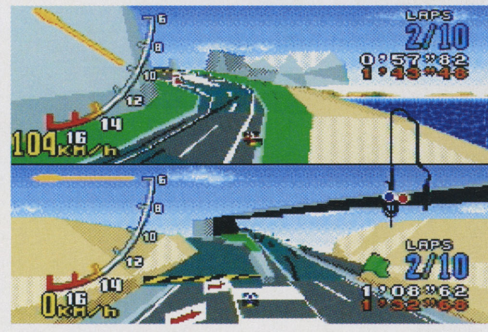
Many of you may be disappointed to hear that, but did you really expect a £14,000 arcade machine for less than £70? If you did, you were just fooling yourself. But that's not to say Mega Drive *Virtua Racing* isn't a damn good racing game in its own right.

All the arcade features are here: the three courses, the pitstops and even the four selectable viewpoints. But the Mega Drive also throws in a few extra attractions, including a hidden 'mirror track' feature, which effectively gives you three more courses to race on; a handicap option; a replay feature; and the ability to choose the number of laps a race lasts. There's also a splitscreen twoplayer mode (which, it has to be said, is this game's saviour).

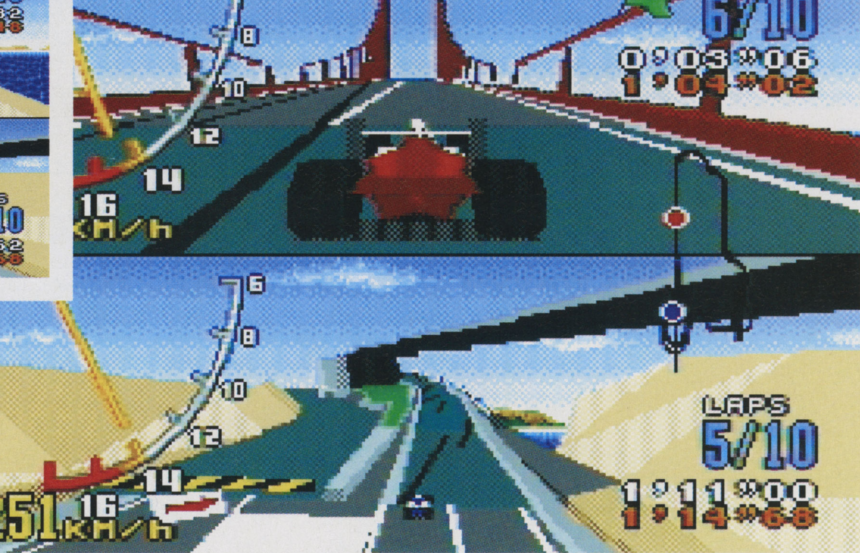
Finish a race in the top five and you get the opportunity to watch a replay of your performance. But instead of reliving the action from the standard viewpoints, you have two



We've just joined the start of a race on track two. A good start is essential in *Virtua Racing*



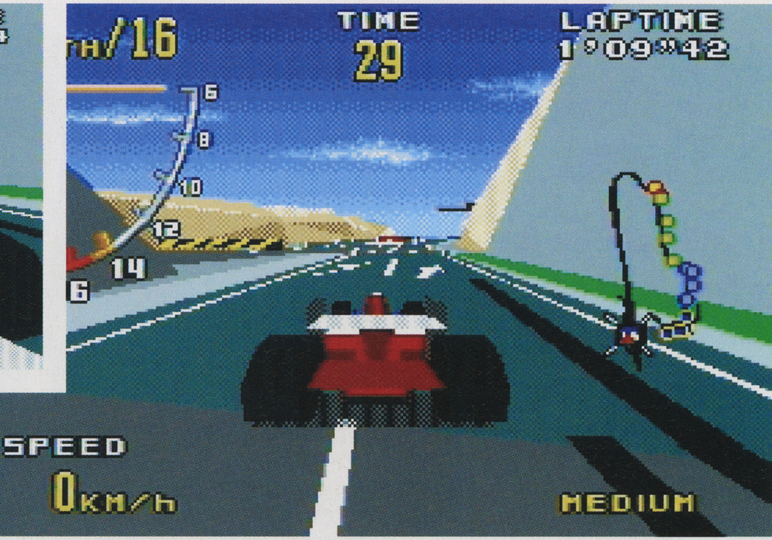
In the twoplayer mode each player can choose his preferred viewpoint



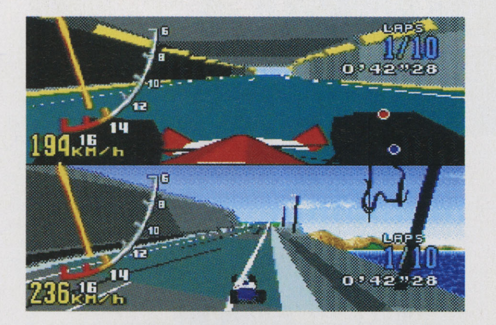
The splitscreen game can sometimes get a little confusing. To make it easier to tell who's ahead, a green flag is displayed beside the lap counter of the lead car

Viewpoints



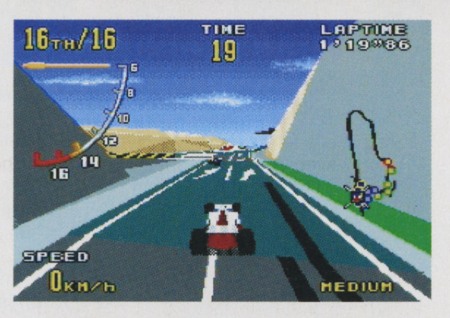


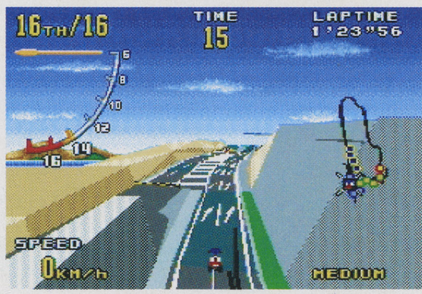
The first view on offer (above) is adequate, but the second (right) is much more practical





Running at 12-15 frames per second, *Virtua Racing* is a great mover – even in twoplayer mode there's no slowdown. It's a pity the SVP only allows 16 colours onscreen, though





The third view (middle) is the best, although the fourth (above) is the most panoramic

Viewpoints

Virtua Racing became famous for many reasons, but it was the four different viewpoints the player could choose that really made it stand out. Amazingly, the Mega Drive version also contains these viewpoints. Access to them is easy on a six-button pad – pressing buttons X, Y, Z or C brings up a new viewpoint – whereas on a three-button pad you can cycle through the four views by pressing the C button.

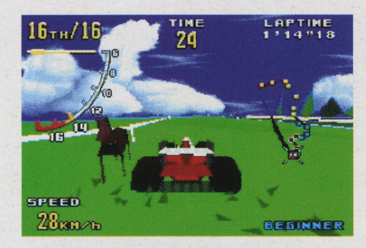
other alternatives: you can either catch the action via a series of 'cameras' situated around the track, or obtain a panoramic view from a 'chase helicopter' which hovers high above the course.

One of the main reasons why large audiences still gather around *Virtua Racing* arcade machines today is the excellent multiplayer option. (Without it, the arcade version – despite being a stunning-looking game – would probably soon lose its attraction.) Luckily, the twoplayer mode in this version offers the same excitement and longterm appeal as the coin-op: both of the rival players have access to the four different viewpoints, and the racing action is both fast and competitive.

But, it has to be said, the oneplayer mode is disappointing. Due to the Mega Drive's graphical inferiority, the oneplayer game fails to deliver a rush of adrenaline in the same way the coin-op did. Of course, *Virtua Racing* was originally designed as a money-spinning arcade game, not as a cartridge for Sega's 16bit home machine, but the game's programmers could have added some extra courses or incorporated some kind of ongoing championship to compensate for the hardware's shortcomings.

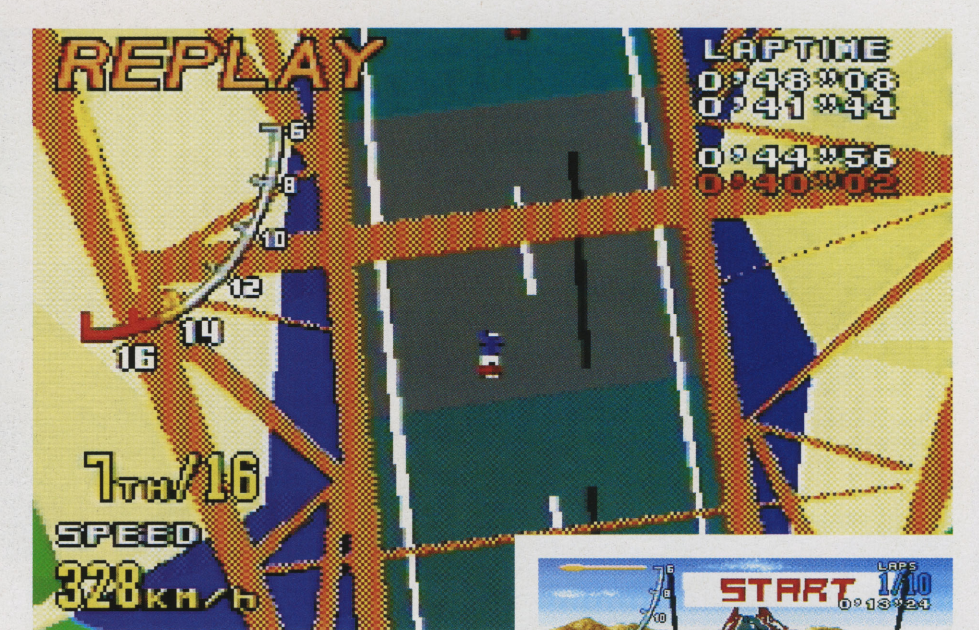
But now to the question everyone will want answering: how well does *Virtua Racing* move? Surprisingly well, actually: it's one of those games that has to be seen to really be appreciated. It's fast (almost *too* fast in

Continued next page





Virtua Racing **contains much of the coin-op's detail, including the horse on track one (top) and the windmills on track two (above)**



Finish within the time limit and you can sit back and watch your efforts in the replay mode

Continued

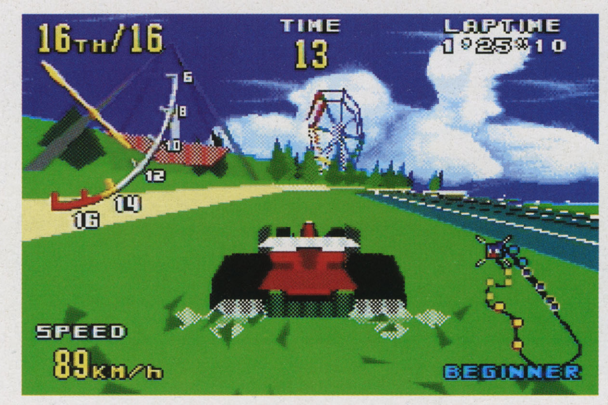
oneplayer mode) and very smooth, even on a British PAL Mega Drive. The SVP (Sega Virtual Processor) chip included in the cartridge has certainly helped to produce a great-looking game, but it's a shame Sega didn't get around to producing a sound enhancer too: the tunes in *Virtua Racing* – although accurate renditions of the arcade music – are dull and the speech sounds very scratchy.

Virtua Racing is an expensive proposition (it costs almost £70), but definitely one worth checking out. Fans of the arcade game will undoubtedly love it, while others will just be impressed by what the Mega Drive can do. Either way, Sega have made a bold attempt to bring home the arcade experience. Just don't expect the Mega Drive to actually deliver that arcade experience.

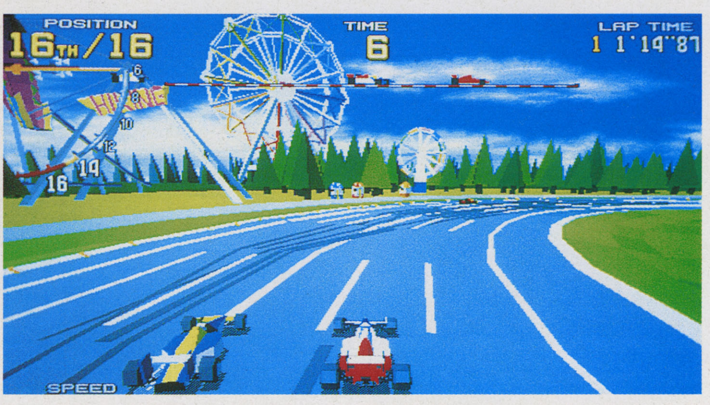
Edge rating: **Eight** out of **ten**



The race has just begun (top), and both players have chosen their views. The third track (above) may be picturesque, but it's also very tough: a cool head is required

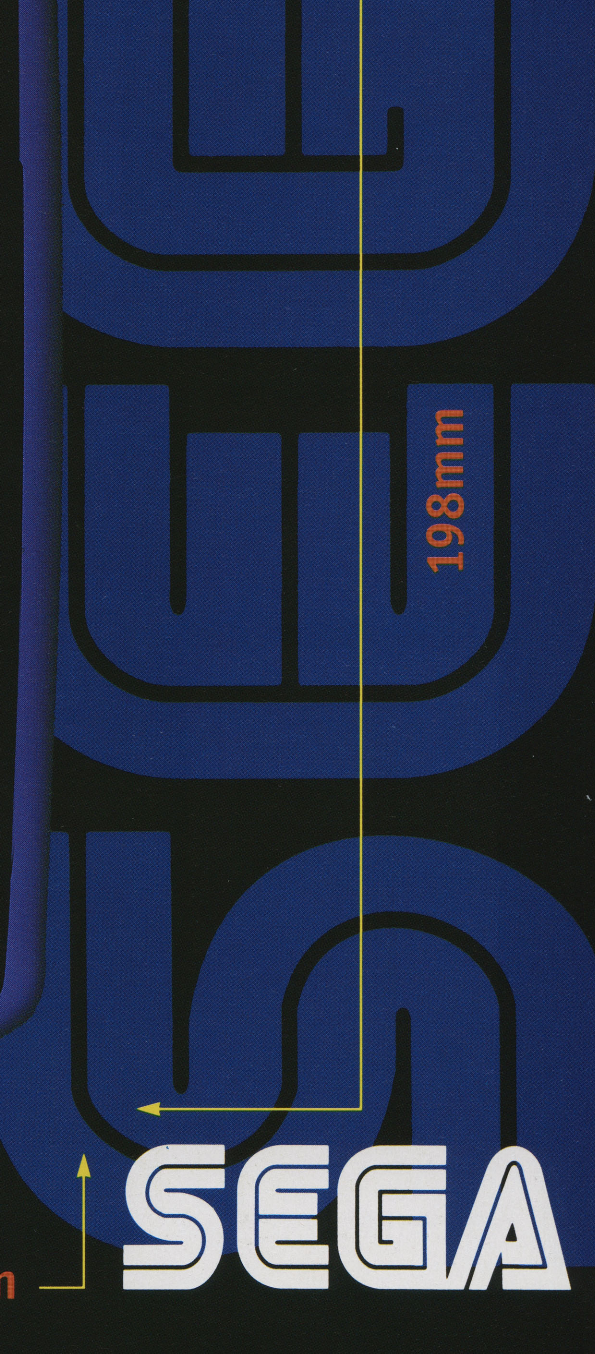


Virtua Racing **looks decidedly 16bit compared to the arcade original (right). But this should come as no real surprise...**



... Since the coin-op could handle 180,000 polygons/sec compared to the Mega Drive's 4,500. A perfect version may be possible on Saturn, though

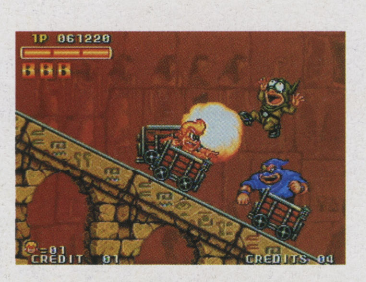
Size isn't everything

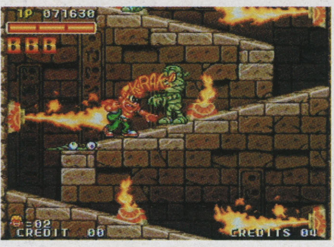


128mm

Spinmaster

Format: Neo-Geo
Publisher: SNK
Developer: Data East
Price: £175
Size: 90Mbits
Release: Out now
Supplied by: Zap Computer Games
Tel: 0532 590077





The mine section (top) is fast and good-looking. The ancient pyramids (above) are full of mummies and fire hazards

Superb, fantastic, splendid, magnificent: these are just some of the words you'll be thinking when you start playing Data East's new Neo-Geo game, *Spinmaster*. But after only 45 minutes' play, the words 'waste', 'of' and 'money' will spring to mind instead.

It's just a crying shame. This is the first non-beat 'em up to appear on the Neo-Geo for some time – and it's woefully easy. We're not talking 'complete within a few days' easy – no siree. We're talking 'tie one hand behind your back and finish the thing in under an hour' easy.

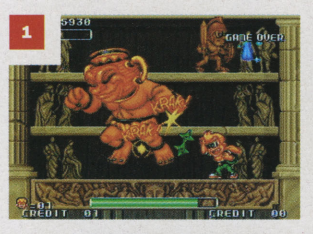
This huge dragon, although ferocious-looking, is incredibly easy to beat. Just let loose with one of your three special weapons

This is a pity, because *Spinmaster* is a great idea that works well. Graphically, it's brilliant, with great use of colour and some superbly designed cartoon-like sprites. Sound is also impressive, with clear digitised speech and some relatively funky tunes accompanying the action. Even the bosses are imaginative, with some of them taking up almost a third of the screen. But it's all far too short lived.

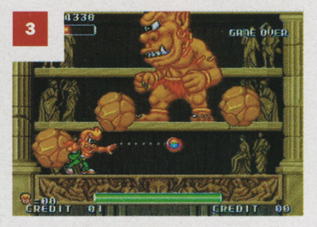
The problem is that this game wasn't designed for the home market (and, to be brutally frank, it shows). All Neo-Geo games are made for the arcade, and as such, are designed to take as much money as possible in the least possible time. The shorter the game, the higher the interest level – after all, who wants to pay money to play a game with 500 levels you're never likely to see?

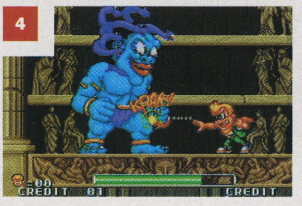
But SNK should have asked themselves, who wants to pay £175 for a game that won't even last them a day? *Spinmaster* is a welcome change from the kind of game usually seen on this system, and is great fun to play while it lasts, but sadly, the fun won't last long enough to justify the extortionate price tag.

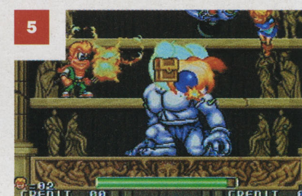
Edge rating: **Four** out of **ten**

1


2


3


4


5


1 The first of the last boss's guises. 2 This flame-spitting head can be trouble. 3 Next, a rock-throwing Cyclops feels the full effect of your yo-yo. 4 A Medusa head is donned for the penultimate battle. 5 Finally, the evil Dr Dokked makes a brief appearance

the
multi mega

...keeps it's muscle
discretely
concealed.
Yes,
inside this
'teeny weeny
carry anywhere'
black box
throbs a monster

Mega Drive,
Mega CD
+
Portable
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Impressed?
YOU WILL BE!

MEGA DRIVE / MEGA-CD
SEGA
MULTI-MEGA
COMPACT disc
OPEN
RESET
GAME ACCESS

198mm Actual Size (Small eh?!)

128mm

SEGA

and that's about the size of it!

The *Strider* coin-op first appeared in 1989, but it was the inferior Mega Drive version that got the glory. Now Supergunners can play the original

Strider

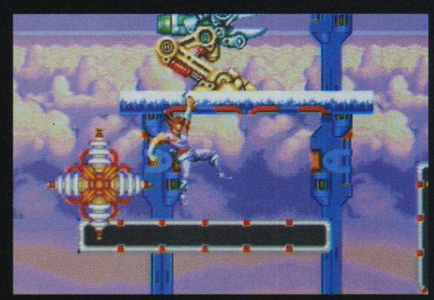


The last boss (above) is a real toughie. Hanging around (top right) has never been so much fun

Format:	PCB
Publisher:	Capcom
Players:	One
Price:	£50 – £100
Released:	March 1989

Capcom's *Strider* was an innovative arcade game, with outstanding graphics and some unusual gameplay features. In fact, anyone who knew anything about games could see that this was a true Capcom thoroughbred. Now, thanks to the Supergun, all those classic *Strider* moments can be relived in the comfort of your own home. And anyone who's played the game before will be quick to tell you what an experience that is.

Although graphically impressive, *Strider*'s greatest asset was its originality. The main character – while sometimes clumsy to control – is easily one of the most versatile ever seen in a videogame: he can run, somersault and cling, Spider-Man style, to any part of the scenery. The game is also very challenging – something the Mega Drive version singularly failed to be, and it's structured in such a way that it allows you to progress a little further every time you play.



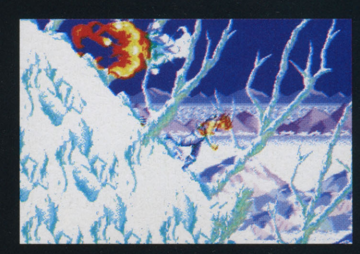
This monkey (above, middle) and dinosaur (above) try their best to thwart your progress

Great music, something of an unknown entity in coin-ops these days, was also one of *Strider*'s qualities. But it was those backgrounds that impressed the most – remember the amazing trip down the side of that mountain? And the impressive lightning effects that silhouetted your character?

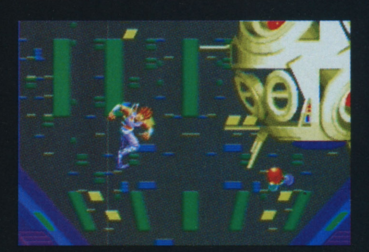
What *Strider* might have lacked in skilful control – especially when compared to a Capcom classic like *Bionic Commandos* – was made up for by game design and bags of imagination. It's a shame the game never received the recognition it deserved when it was released, but maybe now, five years after the game first saw the light of day, Supergun owners will put that right. If they can find a copy, that is...



Level four, and things are getting interesting. Negotiating these wheels is no easy task







That exhilarating run down the mountainside (top). Some levels are shrouded in darkness (middle). The anti-gravity chamber (bottom) can be disorientating



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Aladdin Mega Drive **Super Mario Kart** SNES **Liberation** CD^{32} **Sonic CD** Mega CD **Rebel Assault** PC CD-ROM **Ridge Racer** (arcade) **Fire Emblem** (Japan all formats)



The very latest **charts** from across the entire world of videogaming

Mega Drive

1. **Aladdin** ***Sega (£50)***
2. Sensible Soccer *Renegade/Sony (£40)*
3. FIFA International Soccer *EA (£45)*
4. Sonic Spinball *Sega (£45)*
5. SFII Championship Edition *Capcom (£60)*
6. Toe Jam And Earl 2 *Sega (£50)*
7. Mortal Kombat *Arena Entertainment (£50)*
8. Micro Machines *Code Masters (£35)*
9. Jungle Strike *EA (£45)*
10. Eternal Champions *Sega (£60)*

SNES

1. **Super Mario Kart** ***Nintendo (£40)***
2. Sensible Soccer *Renegade (£45)*
3. Aladdin *Capcom (£50)*
4. TMNT – Tournament Fighters *Konami (£60)*
5. Mario All Stars *Nintendo (£50)*
6. Striker *Elite (£45)*
7. Street Fighter II Turbo *Capcom (£60)*
8. Jurassic Park *Ocean (£55)*
9. Starwing *Nintendo (£50)*
10. Flashback *Sony Imagesoft (£50)*

PC

1. **SimCity 2000** ***Mindscape (£40)***
2. Alone In The Dark 2 *Infogrames (£45)*
3. Premier Manager 2 *Gremlin Graphics (£35)*
4. Frontier: Elite 2 *Gametek (£40)*
5. TFX *Ocean (£45)*
6. Microsoft Flight Simulator V.5 *Microsoft (£40)*
7. Star Trek: Judgment Rites *Interplay (£45)*
8. Sam And Max – Hit The Road *US Gold (£43)*
9. Indy Car Racing *Virgin (£45)*
10. X-Wing *US Gold (£46)*

US all formats

1. **Mega Man X** ***Capcom (SNES)***
2. Batman Returns *Konami (SNES)*
3. FIFA Soccer *EA (Genesis)*
4. Mortal Kombat *Acclaim (Genesis)*
5. Madden NFL '94 *EA (Genesis)*
6. NHL Hockey '94 *EA (Genesis)*
7. Aladdin *Sega (Genesis)*
8. Bulls Vs Blazers *EA (Genesis)*
9. Secret Of Mana *Square Soft (SNES)*
10. Joe Montana Football '94 *Sega (Genesis)*

Amiga CD^{32}

1. **Liberation** ***Mindscape (£35)***
2. Labyrinth Of Time *EA (£25)*
3. Seek & Destroy *Mindscape (£26)*
4. Sensible Soccer 92/93 *Renegade/Mindscape (£25)*
5. FireForce *Ice Ltd (£30)*
6. Pirates' Gold *Microprose (£29)*
7. Psycho Killer *Online Entertainment (£30)*
8. Whales Voyage *Micro Value (£30)*
9. Pinball Fantasies *21st C. Entertainment (£33)*
10. Zool *Gremlin Graphics (£30)*

Mega CD

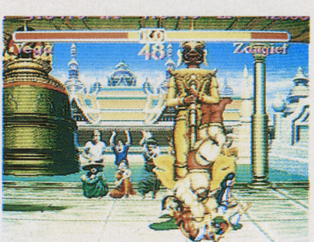
1. **Sonic CD** ***Sega (£45)***
2. Thunderhawk *Core (£45)*
3. Silpheed *Game Arts (£50)*
4. Lethal Enforcers *Konami (£55)*
5. Ecco *Sega (£45)*
6. Sewer Shark *Sony (£45)*
7. Batman Returns *Sega (£50)*
8. Final Fight *Capcom (£45)*
9. Sherlock Holmes *Sega (£50)*
10. Night Trap *Sega (£50)*

PC CD-ROM

1. **Rebel Assault** ***US Gold (£46)***
2. Gabriel Knight *Sierra Online (£45)*
3. Iron Helix *Microprose (£40)*
4. Day Of The Tentacle *US Gold (£46)*
5. Wolfpack *Novalogic (£30)*
6. The Lawnmower Man *Storm (£55)*
7. The Journeyman Project *Gametek (£40)*
8. Comanche: Maximum Overkill *Novalogic (£50)*
9. Dracula Unleashed *Mindscape (£50)*
10. TFX *Ocean (£50)*

Arcade

1. **Ridge Racer** ***Namco***
2. Mortal Kombat II (V.3) *Midway*
3. Super Street Fighter II *Capcom*
4. Virtua Racing *Sega*
5. Virtua Fighters *Sega*



Super SFII **is still battling away in the arcades, but it will soon be superseded by the 'Turbo' version**

Japan: most wanted

1 **Final Fantasy VI**
Square (SFC)

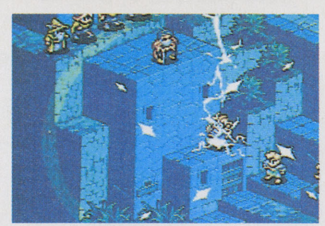
2 Dragon Quest VI
Enix (SFC)

3 Ogre Battle 2
Quest (SFC)

4 Virtua Racing
Sega (MD)

5 Samurai Shodown
Takara (SFC)







Predictably, *Final Fantasy VI* (top) and *Dragon Quest VI* (middle) head the Japanese most wanted list. *Samurai Shodown* (above) is Takara's latest Neo conversion

Japan: all formats

1 **Fire Emblem**
Nintendo (SFC)

2 Mario Land 3
Nintendo (Game Boy)

3 Rockman X *Capcom (SFC)*

4 Dragon Ball Z 2
Bandai (SFC)

5 Ganbare Goemon 2
Konami (SFC)

6 Dragon Quest 1 & 2
Enix (SFC)

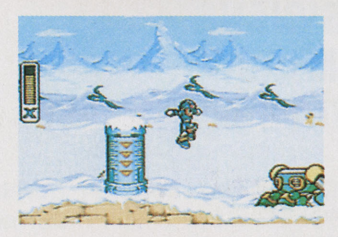
7 Bastard! (sic)
Cobra Team (SFC)

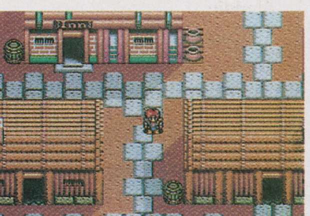
8 Kirby's Pinball
Nintendo (Game Boy)

9 Emerald Dragon
NEC HE (PCE CD)

10 Super Tetris 2/BomBliss
BPS (SFC)







***Fire Emblem* (top), is Nintendo's new 24-meg RPG. *Rockman X* (middle) is blasting up the list, while PC Engine CD game *Emerald Dragon* (above) is a new entry**

Edge readers' most wanted

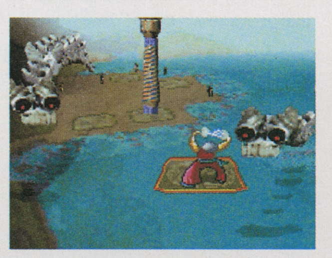
Is there a game you yearn for? A console you covet? Well, why not tell Edge all about it? Make a list of your five greatest games-related desires and send it to: Edge Most Wanted, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

1 **Ridge Racer *(Sony PS-X)***



No surprise that Namco's excellent driving game, *Ridge Racer*, has become the most desired game this month. Outside of an arcade, the only place you'll be able to play it is on Sony's as yet unreleased PS-X

2 Magic Carpet *(PC)*



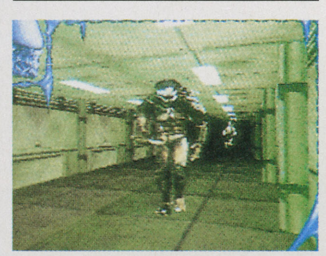
***Magic Carpet* – Bullfrog's Arabian Knights-inspired adventure has truly stunning 3D scrolling**

3 Orion Off-Road *(3DO)*



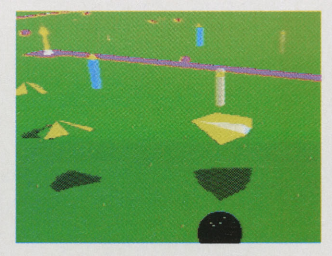
Crystal Dynamics' latest polygon extravaganza, *Orion Off-Road*, follows the current racing trend

4 Aliens Vs Predator *(Jaguar)*



***Aliens Vs Predator* is potentially Jaguar's top title. Let's hope Atari's big cat lands on its feet this time**

5 Guardian *(CD³²)*



Acid Software's *Guardian* is the CD³² answer to *StarWing*, offering total freedom within a 3D world



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In April, SEGA is establishing a new Research and Development Centre in London. It is the first step in one of the most significant investment programmes yet seen within the Games Industry and will accommodate the new Product Development team currently being brought together to create software for Saturn and the new Mega Drive 32 platform.

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ECTS

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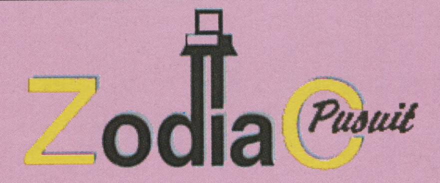
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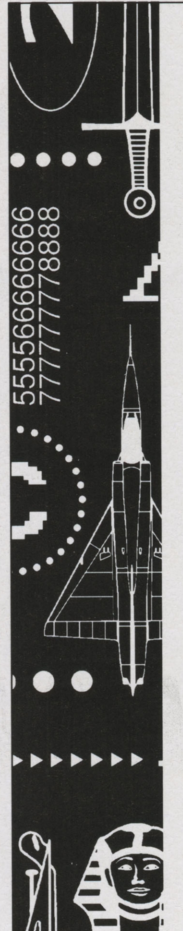
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MicroProse Limited publishes top-quality strategy, simulation and entertainment software across all popular and emerging formats. We have one of the largest internal development functions in the UK, providing a continuous stream of high-quality titles aimed at the European market. Many of these titles are original games concepts initiated in-house. We now require an additional designer to join our existing specialist team.

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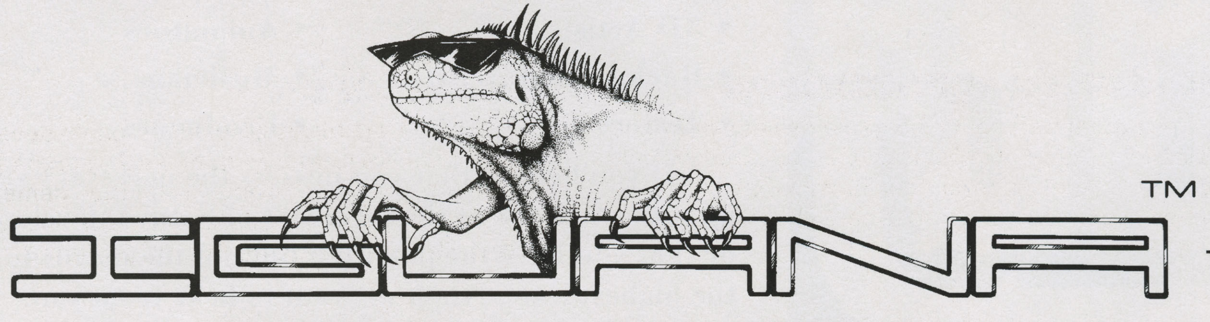
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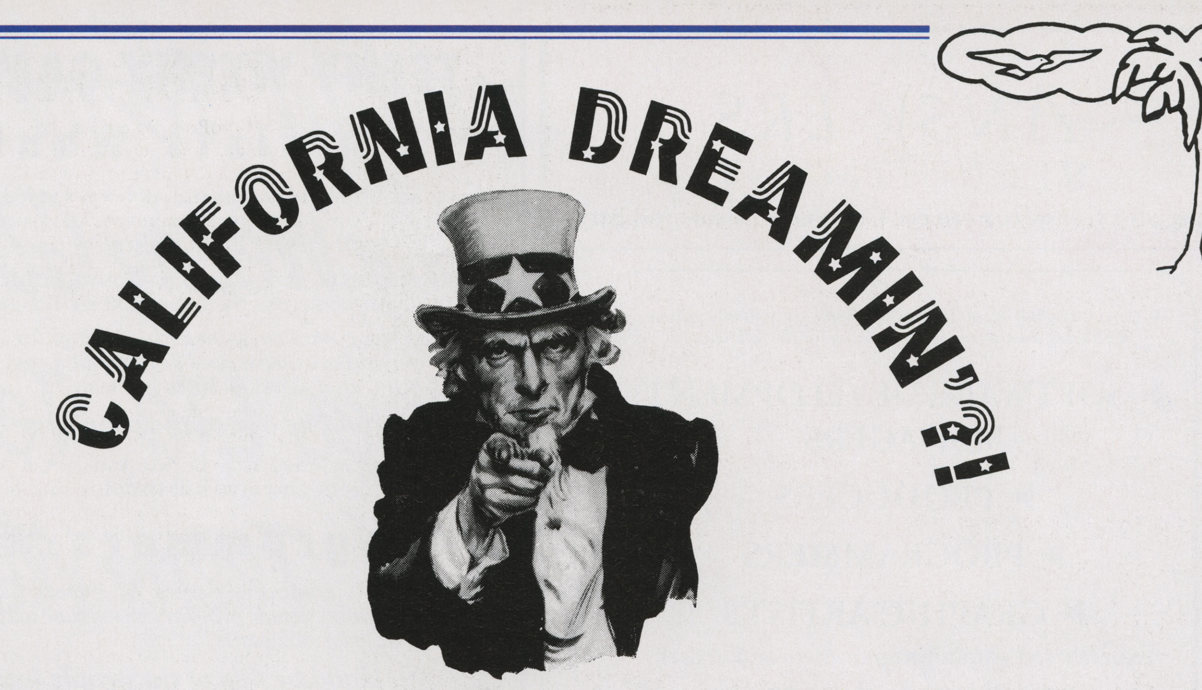
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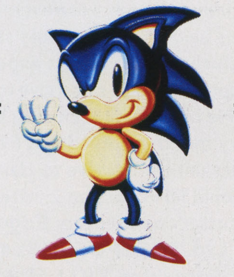
Miss Gina Jackson, Project Manager, Mirage Technologies (Multimedia) Ltd, 14 Moody Street, Congleton, Cheshire CW12 8AP.

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Sega is looking for enthusiastic developers to help build games for the North American and European markets. Our particular desire is to meet with programmers and small development teams, that is, the people who actually do the work.

We'll be holding meetings in the Sega area at the Design Centre during the ECTS on 10, 11 and 12 April

Designers and developers looking to build the next hit on the Game Gear, Genesis, Sega CD or Saturn are invited to stop by to discuss those opportunities.

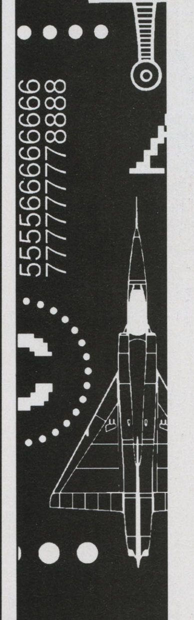
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Mgr. of Developer Relations
Sega of America
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010-1-415-802-4458 (Fax)

Mike Brogan
Dir. of Development
Sega of Europe
071-602-6677
071-603-7304 (Fax)





VIDEO GAMES PRODUCT MANAGER

MicroProse Limited is the European subsidiary of Spectrum Holobyte Inc, and enjoys an unparalleled reputation for publishing high quality PC and Amiga games. MicroProse is currently looking to extend that reputation to new platforms, including current and future Nintendo and Sega machines, 3DO, CD32, Jaguar and others.

Its marketing department is now looking for a video games product manager to drive the direction and launch of all games on the above formats.

The role involves the collection and analysis of market data, leading the search for new opportunities, licences and products and the positioning of games to achieve maximum sales results.

S/he must be persuasive and tenacious as the post involves liaison with hardware manufacturers, licensors and internal staff at all levels of the organisation, in Europe and the USA.

Ideally, the holder of a business orientated degree or HND with a marketing specialism, the successful candidate should also possess demonstrable knowledge of the video games industry, or of a related youth entertainment market. Salary is negotiable, and includes a company car.

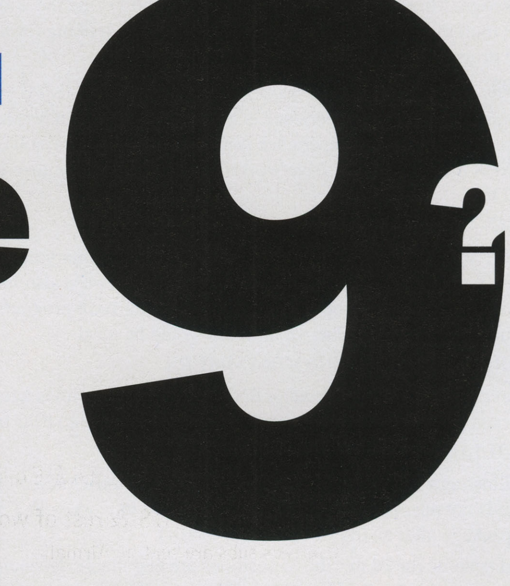
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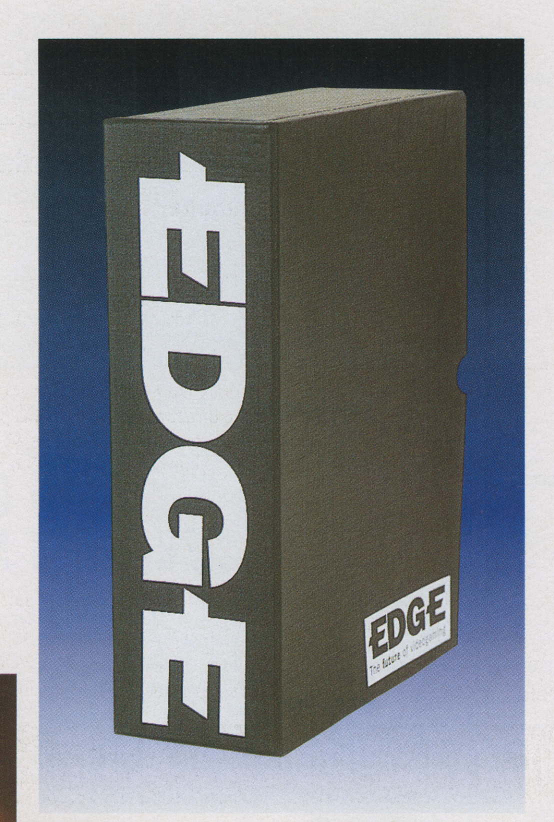
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Edge was recently honoured with the videogames industry's highest accolade, the InDin Magazine Of The Year award, represented in tangible form by the trophy above. Edge is the games industry's first choice; make it yours too

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Photographs: Rupert Pupkin

Bob Faber is one of the crucial players in 3DO's global domination gameplan. If the company is to win significant market share, this is the man who will help make it happen

An audience with Bob Faber

Edge meets Robert B Faber, the man with a mission to sell 3DO to the world

Bob Faber has a daunting task ahead of him. As Senior Vice-President in charge of sales and marketing for 3DO, he has to persuade a public befuddled by the myriad of new machines coming onto the market that 3DO is the interactive system of the future. With CD-i, CD32, Jaguar, Saturn et al all competing to present themselves as *the* next-generation console, Bob will have to use all his considerable experience to overcome the initial scepticism about 3DO.

Before joining the 3DO Company, Bob was Vice-President Of Software Marketing at NEC, and was responsible for bringing 35 TurboGrafx (the US PC Engine) titles into the market. **Edge** spoke to him to find out exactly what his plans are for the 3DO…

Edge How far away is 3DO's UK launch?
Bob We are in the formulation stage, working with Panasonic, working with EA, talking to other licensees to try and put all the right pieces in place for the launch so that it's smooth entering the marketplace.
Edge Any firm details yet?
Bob We're shooting for later this spring. Panasonic will be the first product. We expect to have more than one hardware manufacturer in the UK this year.
Edge Which one?
Bob It's a horserace. We went from working with one licensee to create that one first hardware product, to working with half a dozen licensees on a lot more models of the product to be launched this year. So there was really a huge growth in the amount of engineering and manufacturing work that 3DO needs to do, and since we have limited resources, we can't walk every manufacturer through the process, step by step. We really have to rely on them to take the initiative and move it forward faster.
Edge In the States, when will Sanyo have their machine on sale… fourth quarter?
Bob They've not announced a date for the US. There's a little bit of work that they have to do internally, in terms of deciding an organisation, putting the right marketing people in place, deciding who out of their sales people is going to sell the product.
Edge And AT&T's machine?
Bob AT&T are on track for September in North America. They have expressed some interest in coming to Europe but don't have any firm plan to do that.
Edge Are the internals of all 3DO-branded machines identical?
Bob They're all done to spec: they may

have different sources [for silicon] but it's all to the same specification.

Edge Are AT&T still going to introduce modem technology in one unit, and keep the other like the Panasonic machine?

Bob Yeah, that's what they've said. They want to have two models: one is what they call a 'Communication Station', that has the VoiceSpan, voice-over-data modem – and a second one would be a low-end model.

Edge So what about Panasonic? Would they release an upgrade to make it compatible?

Bob I think Matsushita have expressed interest in a modem, and they are talking with AT&T. Of course, we would like to support one modem standard rather than have lots of different ones, but as long as they were a peripheral licensee, we wouldn't stop them from doing it.

Edge The first machine will just support one to one multiplay, is that right?

Bob Yes, just point to point.

Edge At the WCES, Trip Hawkins mentioned that 3DO is entering into a network trial with US West...

Bob Yes, the telephone company. They're very rapidly exploring broadband technologies and they have chosen Omaha, Nebraska as their first site. And they have gotten approval from the US government to go forward with a test of a broadband network. For six months starting April, they're in what's called the 'technical phase' of the test, where they are allowed to go into 10,000 homes and prove the viability of the system. And then they have a one-year period as a marketing trial, where they'll be testing different services and different fee structures, different usage patterns. And in that phase of the trial, they have authorisation to go up to 60,000 homes. So this is a huge test, and frankly it is the largest test in the United States. So it's a very ambitious project. Because we're such a small company, it's important for us to get into a test; we can't be in ten tests, we don't have the resources, but being in one that's a really good one – high profile, large, very ambitious – allows us to find out everything that we need to know and everything that US West and other companies will need to know.

Edge What are its potential uses?

Bob I think that downloading games is an obvious application; they also want to test shopping and different information services, and of course video-on-demand. After that they're going to assess what worked, what should they change, what they should leave.

Edge Acting as a set-top box, does the 3DO have all the necessary hardware for video-on-demand?

Bob Well, it [the trial machine] isn't just a standard consumer player. It has to have some modification, it has to have the circuitry to connect to the cable system and has to have the decoding circuitry for accepting the signals, so it's got some added overhead for the network software. But other than that, it acts just like a stand-alone system.

Edge What about MPEG Digital Video cart – is it finished and on sale?

Bob It's not on sale yet; it will be available in Spring. Panasonic haven't actually announced the exact date of their first shipment.

Edge What will be its first applications?

Bob I'm not sure what the first one will be, but at CES Electronic Arts showed *Shock Wave* and *Road Rash* using MPEG.

Edge Will they be titles that utilise MPEG if the cart is installed, and run software like *CinePak* if it isn't?

Bob That's a bit harder to do, because if you make a product that uses the whole disc, you then have to make two discs. I think there's a more intelligent way, and what I would recommend a publisher do is release their product for the entire base, using *CinePak* or some other software compression routine, and then if you have MPEG, for $5 you get an upgrade. I think that would be acceptable for consumers and would be the most economical way for a publisher to pursue it. It's still going to be some time before the whole base has MPEG, because MPEG installed adds too much cost to the base unit.

Edge Is 3DO interested in making sure DV films are in the marketplace?

Bob We're certainly interested in that. But I would like to make a distinction between video CDs and movie CDs. Because today's CD doesn't hold the whole movie, it's not really convenient, nor of as high a quality as you would want, to have as a replacement for videocassette or LaserDisc. So I don't believe it serves the consumer well to sell movies as a feature of the current generation of products. To do that says to the consumer: 'Don't worry, all the movies are going to be available on this format.' And we spent a lot of time talking to our partners and hardware manufacturers and in Hollywood, and I don't believe any of those companies are going to support regular CDs as a movie format for regular publishing. They really need a next-generation CD that has higher density and allows for higher capacity and higher-quality playback.

What we will be doing is encouraging things like shorts, and cartoons and video products that aren't full-length movies, because you can do those on a disc, and they're things that consumers will want to have. But it's a very fine line between just



'We are a company formed by software people to serve the software industry, and one of the ways to do that is to make it easier and less expensive to produce titles'

Continued next page

interview

creating a hook that's a promise you can't deliver on, and providing something that's actually a benefit for the consumer.

Edge That's a fairly scathing indictment of CD-i at the moment…

Bob I think that Philips' CD-i was a great idea when it was first conceived, but it took too long to come to market, so that the quality of the software just passed them by. As a result, they can't hang their hat on interactive software, so they're forced to turn to something else. But it's unfortunate that that something else, over the long term, cannot be sustained. I think what consumers are really interested in is interactive performance. And that's what's great about 3DO.

Edge So 3DO isn't going to be like Philips and get involved with movies at all?

Bob No.

Edge How do you see software developing in terms of using MPEG?

Bob We have focused our efforts on creating the best low-cost tools possible so that developers can afford to integrate MPEG into interactive titles. For example, we have just created an encoding station. The typical cost for an MPEG encoding station is about $200,000. We've developed one that costs $30,000, so we've got it out of the high-end post-production house into the developer's studio. We are a company formed by software people to serve the software industry, and one of the ways to do that is to make it easier and less expensive to produce titles. So when we think about MPEG, we think: 'How do we make this useful for a developer?' and 'What do they really need so they can afford to incorporate this into their products?' The encoding station was a big hurdle, so we focused on getting that done.

Edge How has 3DO done so far?

Bob We're actually very satisfied with the launch. I've seen some of the press over here, which is really a scathing attack on 3DO and the launch of 3DO in North America. Actually, I take it as a compliment that our competitors think so highly of us that they have to resort to mudslinging at this early stage in development.

What we did in the Fall was get into the marketplace. We said all along last year that what we really needed to do is hit the beach in '93, because the first Christmas is never a great Christmas for a new product. You're just entering the distribution channel, the salespeople don't know how to sell it, you don't have good advertising presence. But it allows you to get a toehold in the distribution channel. Panasonic helped put the product into the market last Fall, and it was in less than 10% of the distribution channels in the US, and it sold really well. So the retailers are really happy, and they're all coming to us saying, 'Fantastic, let's expand!' which is exactly what we need. Because in 1994, the market is ours, and we're gonna make hay.



'I think we could have certainly done better if we had more software available. Early on we sort of knew we wouldn't have great titles out at launch, but all the titles are good titles'

Edge What about the software at launch?

Bob Well, actually, I'm not entirely happy about that! [Laughs.] I think we could have certainly done better if we had more software available. Early on we sort of knew we wouldn't have great titles out at launch. I think all the titles are good titles, and they're all better than that title or similar titles on any other system. So they still showed that the technology was great.

Edge It was a surprise that there were no EA titles at launch…

Bob I think the leap from 16bit platforms to 3DO is a huge leap. And in order to do it well, it took more time than people thought it would take. But I think that when consumers see the products, they're going to say this was worth waiting for.

Edge 3DO is trying to become a global standard, so will there be any software compatibility between the United States, Japan and Europe?

Bob We actually expect 3DO discs to work in different machines. There are some differences, however: if you have a Japanese piece of software that needs Kanji support, then you would have to buy a Japanese-model 3DO. So there are those differences, but the programs should be compatible. So if you buy an NTSC piece of software in America and bring it to Europe, it should run in a PAL machine. It will run in letterbox, but it will run.

Edge Will the UK system be letterbox?

Bob The UK system will be letterbox for NTSC titles, but will have full screen for native PAL-developed titles. There are PAL development tools: again that's a choice of the software developer; they can either choose to make their title in native PAL or they can choose to use NTSC.

Edge Who are your next rivals?

Bob I think there are a lot of companies that are potential competitors. The way I usually try and categorise it is like this: there are the companies that are going to be part of the 3DO family, like all the companies that were part of the VHS family. And then there are the Betas. And a couple of them have already made themselves known. I think they will all have a place in the market and will have some measure of sales, but the 3DO has already staked out the ground that's required for longterm success, so it will be very tough for them to overcome us.

Does 3DO have what it takes to win against the likes of Sega and Nintendo? Bob Faber thinks so; only time will tell if his confidence is well placed.

Middlesex

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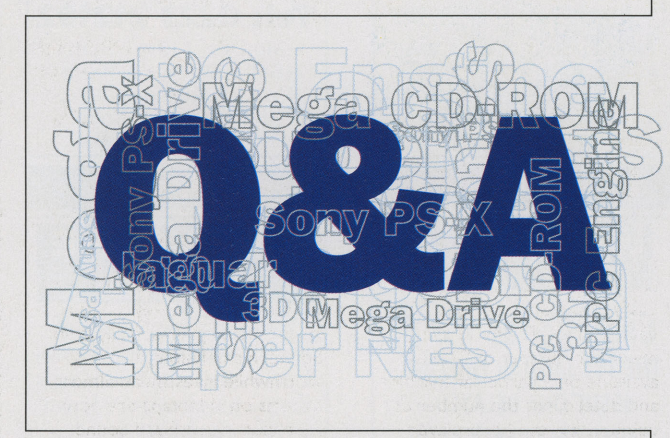
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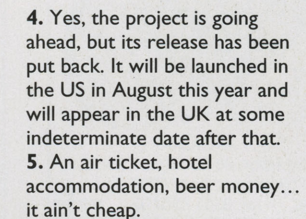


Edge hacks through the jargon and tells you what you really want to know about videogames

Q I have some questions about the next generation of consoles.
1. Do you know if any software will be packaged with the forthcoming Sega Saturn machine, as I am thinking of buying one when it is released?
2. In **Edge** 6 you did a feature on the Bath-based software company Binary Asylum. Their PR and ideas manager was called Andy Smith. Is this the same Andy Smith who used to work for Future Publishing?
3. Also in **Edge** 6, you said that the Sony PS-X version of *Ridge Racer* should be almost as good. Have Sony and Namco got some sort of deal?
4. I was very interested in the VR system for the Mega Drive when I first heard about it, but Sega haven't talked about it recently. Is the project still going ahead?
5. Roughly how much would it cost to visit the Summer '94 CES in Chicago?
6. Is there any more news about Nintendo's Project Reality?

Dan Lewis, Kent

A **1.** It's highly unlikely that Sega Japan will package anything with Saturn when it appears in Japan this December. There are two reasons for this. Firstly, the machine will be expensive, and a game will only add to the cost. Secondly, the Japanese have a tradition of packaging hardware on its own, leaving players to choose their own games. The later European and US launches might include games, though.
2. Yes, the former Sega Power editor and ACE writer crossed the border into software development land last year. And if *Zeewolf* is anything to go by, it looks like he's made the right choice. Nice one, Andy.
3. Yes, in November last year Namco signed a deal with Sony to use PS-X hardware in their forthcoming coin-ops – it's *that* powerful – and in return Namco have agreed to develop software for the PS-X. See our news article this issue for an opinion on whether the Sony version will be as good.

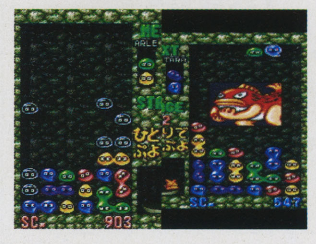


4. Yes, the project is going ahead, but its release has been put back. It will be launched in the US in August this year and will appear in the UK at some indeterminate date after that.
5. An air ticket, hotel accommodation, beer money… it ain't cheap.
6. Check out the news this issue.

Q I have read a lot of technical features in magazines but your articles on FMV and 3D graphics in **Edge** 6 must be among the best I've ever read. This leads onto my questions.
1. Which is the better signal for broadcasting: NTSC or PAL?
2. The FMV article mentions that PAL works at 50Hz, resulting in 25 frames per second. Does this mean that we have non-interlaced televisions?
3. Why is the frame divided into two fields?
4. Why would quarter-size data pits be needed to store 148 minutes of MPEG2 data?
5. Why do the Mega Drive and SNES produce letterbox displays?
6. In the 3D article it stated that true texture mapping takes up too much processing power to be implemented in 'realtime' on 'cheap' machines because every pixel on a polygon surface must be rotated individually. Could you please explain this?

Azher Kahn, Manchester

A **1.** PAL has more horizontal lines than NTSC (625 compared to 525) and therefore gives a slightly more detailed image.



Why does PAL equal borders? (See letter from Azher Kahn)

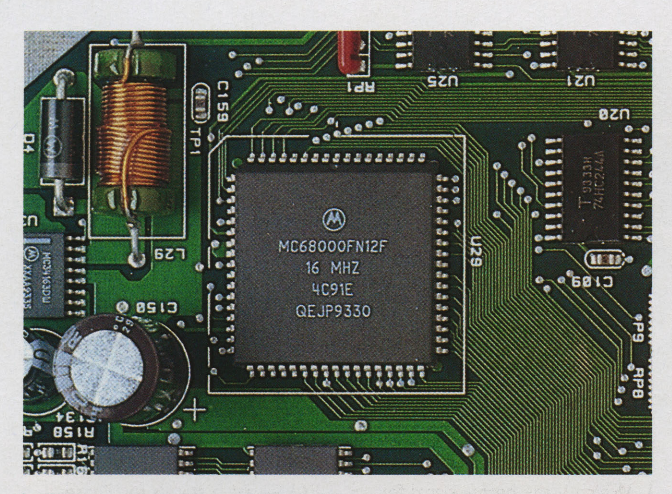
2. No, PAL is an interlaced system – the two fields (alternate lines) of every frame are interlaced together to give 25 frames per second. This is what PAL – which stands for Phase Alternate Line – in fact means.
3. Presumably because the broadcast standard cannot manage a 50Hz non-interlaced image.
4. An ordinary CD can store at best about 74 minutes' worth of MPEG1 digital video. MPEG2 has a far higher picture quality than MPEG1, so it follows that a whopping 148 minutes of MPEG2 would require considerably more data than a conventional CD can handle (work it out). The only solution is to make the data physically smaller by reducing the size of the laser-readable pits on the surface of the CD.
5. Because the NTSC system is designed to occupy 525 lines, and therefore when an NTSC (US or Japanese) SNES or Mega Drive runs on a PAL TV system (625 lines) there are 100 unused lines, which are visible as two black borders at the top and bottom of the screen.
6. Think of a texture-mapped polygon as a polygon with a painting laid on top of it. Every pixel that makes up this painting must be handled individually; this, as you'd imagine, takes up a lot of processing power, and therefore isn't feasible on less powerful machines.



Sega's Model 2 CG board maps detailed texture onto the individual polygon faces in *Daytona GP* (see letter from Azher Kahn)

Q Can you give me some information about the Saturn and the Jaguar?
1. What processor does the Jaguar have?
2. How fast does it run?
3. How many colours can the Saturn handle?
4. Will *Mortal Kombat* be released on the Jaguar?
5. Which machine does **Edge** think is the best?

No name supplied



While the Jaguar has a 64bit multiprocessor architecture, it uses a much slower Motorola MC68000 to take control of the chipset



1. and **2.** A Motorola MC68000 running at 13.3MHz.
3. 16.7 million with usable palettes of either 1024 or 2048.
4. It was originally going to be, but this now seems doubtful.
5. The Saturn will be infinitely more powerful, but whereas you'll have to wait for that, Jaguar gives you the opportunity to buy a 64bit machine now for a reasonable price.

Q Could you please explain the following terms to me, used in issue five, about the new Sony and Sega super-consoles.
1. Clearing capacity (MIPS).
2. Bus bandwidth (Megabytes/second).
3. Polygons/second (plain and texture-mapped).
4. Simultaneous polygons.
5. Pixels per frame.
6. CLUT limit.
7. PCM, ADPCM, and FM sound chips.

Tony Church, W Sussex

A **1.** Clearing capacity is one of the terms used by Sony's Japanese press release for the initial PS-X specs list. As far as we can ascertain, it simply refers to the total number of instructions that can be executed per second. The clearing capacity of the CPU is 30MIPS (millions of instructions per second) while the total clearing capacity for the entire architecture is rumoured to be approaching 500MIPS.
2. Bus bandwidth refers to the capacity for data to travel around the chipset of a system. Generally, the wider the bandwidth, the faster a machine can shift data around. The 3DO and Jaguar are particularly effective at this.
3. and **4.** Polygons are what most 3D graphics consist of. A measurement of polygons per second gives an approximate indication of the level of screen detail a system can model in realtime. *Virtua Racing* and *Virtua Fighters* in the arcade both manage around 180,000 polygons per second and the games run at 30 frames per second. That means that in every frame of animation these games have about 6000 polygons onscreen (simultaneous polygons).
5. Pixels per frame is simply the number of pixels (screen dots) that can be moved every frame or screen refresh.
6. CLUT stands for Colour Look-Up Table and refers to a palette of 16 colours previously defined by a programmer. When a machine has thousands or even millions of colours available, giving the screen access to all of them simultaneously is impractical. This is where a CLUT comes in. With only 16 colours in the CLUT, each one can be accessed quickly and easily, using only four bits of data. The CLUT limit is the maximum number of CLUTs available on a particular machine, and determines the number of colours that can be displayed onscreen at any one time. The SNES, for example, has a CLUT limit of 16, meaning a maximum of 256 (16x16) colours simultaneously (from a total palette of 32,768 colours).
7. ADPCM (Analogue to Digital Pulse Code Modulation) refers to sound that, rather than being electronically sampled, is recorded conventionally, then converted to digital information.



The PS-X can render polygons like this dino head at 60fps



How many polygons per second can *Virtua Fighters* handle?

Q I am planning on getting a Dolby Pro-Logic Receiver. Please can you tell me if there have been any new games with Surround Sound since issue one of **Edge**, or if there are any games planned incorporating Surround Sound. Also, I have been told that a Nicam signal is required for Pro-Logic Surround Sound to work. Is this true? And if so, does that mean that the SNES produces Nicam signals? Finally, what is the difference between Nicam digital stereo and ordinary stereo? Can an ordinary stereo TV do the same job?

Steven Hong, Peckham

A To be honest, if you're thinking of buying a Surround Sound AV decoder exclusively for use with games, don't – the number of Surround Sound-compatible games to be released so far is too small to justify the expense of the system. However, if you fancy watching films in Surround Sound, it's definitely a worthwhile investment: almost all films on videotape are now recorded in Surround Sound.

Nicam is the name given to the standard for broadcast digital stereo – all stereo TVs and VCRs (but not games systems) are Nicam. To hear TV programmes, films or videotapes in Surround Sound (or indeed, ordinary stereo), you need a Nicam TV or VCR. E

Q and A

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Yamaha's DSP-A970 is one of many sound processors using Dolby Pro-Logic for advanced Surround Sound (see letter from Steven Hong)

Next month





Next issue Edge infiltrates Sega's amusement machine R&D department, AM2, for a one-on-one with Yu Suzuki – the brains behind Sega's racing coin-ops: *Hang On*, *Out Run*, *Power Drift*, *Virtua Racing*, *Daytona* and beyond...

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